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WHAT is generally described in progressive and independent newspapers as "the overthrow of Cannonism" in the national House of Representatives, with the extraordinary struggle that preceded it, will furnish material for one of the most interesting chapters in our political history. Judgments will naturally differ, just as they do now. As to the essential facts, however, there is no room for dispute.

There was nothing surprising in the growing unrest of the more independent Republican members of the House under the rules and the Speaker's use of them. At the beginning of the special session of this Congress an effort was made to change the rules materially, but it failed, and only slight concessions were obtained by the so-called insurgents. "Calendar Wednesday" was established for the benefit of minor measures, or of members who had long complained that they "had no chance" to serve their constituents or the people generally on account of the arbitrary and despotic ways of the small committee on rules, of which the Speaker was the chairman. Calendar day proved a desirable innovation and it actually removed some of the abuses that had caused the rise and development of the anti-Cannon movement. But the relief was inadequate. Discontent steadily grew; attempts were vainly made to induce the Speaker to announce that he should not again be a candidate for the same office; local Republican conventions and meetings began to pass strong anti-Cannon resolutions.

The general situation was favorable to a "coup." A trivial question in connection with a bill amending the Census

act—a question whether Calendar Day bills could be displaced by a "privileged" resolution reported to the House—gave the insurgent Republicans the opportunity they needed. The Speaker was overruled by the House on the point of procedure and saw in the incident a "rebuke," although he had always contended that he was the servant of the majority and that all talk of his "czardom" was shallow and demagogical. Representative Norris of Nebraska, one of the insurgents, surprised the Speaker and his supporters by offering as "privileged" a resolution providing for important modifications of the rules. The reading of his resolution created a sensation and precipitated a battle royal which, after an all-night session and many dramatic episodes, resulted in a severe defeat for the "regulars" and their chief, the Speaker.

The effect of the amendments carried by a combination of forty-one insurgent Republicans and Democrats—a combination many declare "unnatural," though no party question was at stake—is to make the committee on rules, which controls the business of the House and determines the fate of most legislation, elective instead of appointive; to give the House itself the right to elect this committee; to enlarge its membership from five to ten, and, finally, to make the Speaker, its chairman heretofore, ineligible to membership in it under any circumstances.

The adoption of the Norris resolution involved the overthrow of "Cannonism," though not the retirement of Speaker Cannon. A resolution declaring his office vacant was defeated, all but a few of the insurgents voting against it with the "regulars." There was no desire to humiliate Mr. Cannon unnecessarily; it was simply thought imperative to get rid of a bad system—a system which had been adopted in the interest of efficiency in legislation but which had become the greatest obstacle to efficiency. The committee on rules had too much power, and the Speaker controlled the committee. By "special rules" the committee would bar amendments, restrict debate, "jam through" contentious bills in spite of

deep and serious dissatisfaction with them on the part of scores of Republicans.

It is hoped that the new and enlarged committee will reflect the sentiments of the House; that it will be more amenable to popular sentiment and fair in its acts and methods. It is probable that the far-reaching nature of the change will not be realized this year, but, unless many thinkers and trained statesmen are greatly mistaken, the reform will superabundantly justify itself in time by its fruits in the shape of better legislation, higher efficiency, freer and more useful discussion of public questions.

It is now proposed to follow up the reorganization of the committee on rules by taking from the Speaker the whole power of appointing committees and "elevating" or degrading Representatives in accordance with his ideas of party discipline or personal loyalty. There are writers who hold that the American Speaker, like that of any European parliament, should be merely a moderator or presiding officer, and that all committees should be elected by the House itself, at least by a large committee on committees representing the entire House. This will bear examination. We have gone too far on the road to concentration of power in the Speaker and have thereby exalted his office at the expense of the individual representative, the majority, the House itself. There has been much talk of the "decadence" of the House, its loss of influence and prestige, and the consequent encroachments on its functions by the unpopular Senate. Possibly the anti-Cannon uprising spells the beginning of a movement for the rehabilitation and rejuvenation of the House.

Postal Savings Banks—Pros and Cons

The Senate has passed the postal savings bank bill, and the probabilities at this writing are that the House will take similar action. As passed by the "upper branch," it must be admitted, the bill satisfied no one. It was so amended

to overcome opposition from various sides that alike its constitutionality and practical usefulness were seriously doubted by friends of the idea. The House will further amend it, and in its final form it may represent a fairly acceptable compromise.

The arguments for postal savings banks may be briefly summarized as follows: Most of the other civilized countries—and some semi-civilized ones—have such institutions in order to promote thrift, safeguard the small savings of the poor man or woman, and prevent the withdrawal of money from circulation through hoarding. Certain governments have found the postal banks a source of strength to the national credit, as they invest the funds thus deposited in their own bonds, paying low rates of interest. Wherever the banks have been established, the number of depositors has steadily grown, and money has been saved for productive industry and proper use that might otherwise have been wasted or foolishly spent. The United States, owing to its territory, diversity of conditions, industries, stages of material development, heavy immigration, and heterogeneous population, needs postal savings facilities even more than, for example, Canada, or England. There are many states and vast areas in the country in which there are practically no saving facilities for the laborer in lumber and railroad camps, the agricultural laborer, the small rural trader, the servant, the miner. Besides, even where private and commercial banks abundantly provide such facilities, as they do in the east and middle west, foreigners distrust them owing to an occasional failure or embezzlement, and owing, also, to their ignorance of our laws and conditions. They have dealt at home with state banks, and they would deal here with government institutions if they could be conveniently reached. As it is, they either send their savings to "the old country," or else they keep them in "secret places" and invite burglary. The bankers who fear that their depositors would transfer their savings to the postal banks are assured that they are absolutely in no danger of

any material loss of patronage and profit, since the government's rate of interest on deposits would be very low—only two per cent—and since new classes of depositors would be created and money brought out of "stockings," "holes in the ground" and similar places.

These arguments, however, have not convinced the bankers and other opponents of the bill, who assert that postal banks would do more harm than good in the United States, first, because they would encourage speculation and gambling by transferring money from the undeveloped and remote communities to the great centers, and especially to Wall street, and, second, by disorganizing our whole fiscal system. They go on to deny that it is either the privilege or duty of the federal government to "promote thrift;" our whole system of government, they contend, being based on the principles of self-help, private initiative, freedom, and the building of character by struggle and experience, failure and success, in a "fair field and no favors."

It is also contended that there is no provision in the Constitution which authorizes the government to go into the banking or safe-deposit business, and that any bill for postal banks frankly drawn is improper and unlawful on its face.

As stated, the bill passed by the senate is a compromise which attempts to guard against some of the alleged dangers pointed out, especially the danger of diverting capital and money from the communities which save them to centers of speculation and gambling. To make the bill constitutional provisions have been inserted for the investment of the deposits in national bonds in time of war or emergency. The whole thing as it stands is crude, tentative, and experimental, but there is every reason to believe that, once established, postal banks will develop and expand and demonstrate their usefulness, so that their abolition will be out of the question, and legislation will concern itself with their improvement and their safety.

Landscape Beauty and the Billboards

The billboard question is vital and acute in many American communities. These signboards have not only destroyed the amenities of the landscape and marred the pleasure of country travel to a considerable degree, but they have invaded the cities, the parkways, the residential streets, and have assumed monstrous proportions. For some years friends of municipal progress, beauty and civic art have endeavored to check the growth of the ugly, vulgar, threatening billboard, and thanks to the new "town planning" movement they have been fairly successful as far as securing local legislation and regulation is concerned. The courts, however, have not been over-sympathetic to these efforts. They have sustained billboard ordinances where it was clear that they were intended to protect public safety or public morality, but they have not been willing to admit that esthetic grounds—the nuisance of ugliness, offences to the eye—justified interference with property rights. Not much advance is possible where the courts adhere to this rigid doctrine, but there are indications that some judges are beginning to admit "the claims of beauty," the right of legislatures and city or town councils to exclude or drastically regulate billboards on artistic and general social and civic principles.

A strong "anti-billboard" decision of the Missouri Supreme Court has been attracting attention and favorable comment throughout the country. The judge who wrote the opinion referred to the advertising value of the billboard and said:

> The amount of good contained in this class of business is so small in comparison to the great and numerous evils incident thereto that it has caused me to wonder why some of the courts have seen fit to go so far as they have in holding statutes and ordinances of this class void. * * * My individual opinion is that this class of advertising, as now conducted, is not only subject to control and regulation by the police courts of the State, but that it might be entirely suppressed by statute, and that, too, without offending against either the State or Federal Constitution.

In some cities an attempt is being made to prohibit the

placing of billboards on roofs of buildings, and the Missouri decision is depended on to sanction this measure of regulation, which is objected to as "extreme" by the interests affected. Of course, the more liberal the billboard legislation becomes the more disposed the courts will be to give the public and the cause of civic progress the benefits of their legal doubts, for judges, like lawmakers, are unconsciously influenced and moved by public opinion and the spirit of the age.

The campaign against the unsightly, obnoxious, and flagrant billboard, with the comparative rates of progress achieved here and elsewhere, is briefly summarized in the following extract from an article in the New York *Evening Post*:

> In Washington no more permits are being issued and billboards there will soon disappear altogether if the district commissioners maintain their attitude on the subject. In Kansas City and Cincinnati progress has been made toward restriction. In England, Parliament passed an act in 1907, giving local authorities power to regulate or even "prevent the exhibition of advertisements in such places and in such manner as to affect injuriously the amenities of a public park or pleasure promenade or to disfigure the natural beauty of a landscape"—a distinct step in advance of any American legislation. There is plenty of room yet for the exercise of the authority so granted. In France, there is close supervision and a tax. In Germany, there is close restriction, and franchises for advertising kiosks are granted, Berlin receiving $95,200 annually from the holders of the privilege. In South America, cities such as Buenos Ayres, Rio Janeiro, Lima, and Valparaiso, billboards are regulated and taxed, the city of Buenos Ayres itself putting up the boards and renting the space. In America are almost the only cities in the world, where the billboard—untaxed and scarcely regulated at all—is free to revel in its blight.

Mr. Rockefeller's "Benevolent Trust" and Efficient Giving

Application has been made to Congress for a charter incorporating the Rockefeller Foundation, the purposes of which are stated to be as follows: To promote the well-being and to advance the civilization of the peoples of the United States, of its territories and possessions, and of foreign lands; to prevent and relieve suffering; to encourage the dissemination of knowledge; and to promote any or all of the elements of human progress.

What proportion of the vast fortune of the Rockefeller family is to be appropriated to these purposes, or turned over to the foundation, has not been stated, but informally the press has been given to understand that practically all of Mr. Rockefeller's millions, estimated at between $300,000,000 and $600,000,000 are to be devoted to philanthropy, research, encouragement of science, humanity, education, and social improvement. John D. Rockefeller, Jr., it is reported, intends to retire from business and identify himself with the foundation, directing it in association with other eminent incorporators and trustees.

The application, naturally enough, has excited world-wide discussion. It has, of course, been highly commended for its spirit, for while America has long been famous for its generosity, for the splendid gifts annually made to educational, scientific, benevolent, and artistic activities, such an unprecedented step as is contemplated by the head of the Standard Oil Company is startling and extraordinary even for us.

Mr. Rockefeller himself has been reported as saying that it has been his great ambition to develop high efficiency in giving. He has even suggested "a congress of givers" to meet annually and consider requests, plans, and petitions for aid, and to prevent inequitable distribution of funds available for endowment and charity, as well as duplication, waste, and hasty action. It is admitted by all that there is great need of better organization and better administration of benevolent funds, whether used locally for ordinary aid and relief, or nationally and internationally for larger and permanent purposes.

As to the principle involved in the application, it is not new. There are already incorporated "foundations"—the Carnegie, the Russell Sage, etc.—for the support of education and research, and many churches and philanthropic societies are incorporated. Charitable agencies have combined in order to utilize their means economically and guard against fraud and abuse; clearing houses for charity have

been proposed or actually established to protect givers and worthy causes. The extended and strengthened Rockefeller Foundation would, therefore, constitute no novel departure in the full sense of the phrase.

Yet objections and warnings against the application to Congress have not been wanting—and from sources that command attention and respect. Mr. John Bigelow sees much danger in corporations with such powers as are asked of Congress in this case; he doubts whether the constitution authorizes the conferring of them, and even thinks that some of them involve a direct violation of the constitution. He fears that such benevolent trusts may attempt to control elections and party policies; he suggests an express time limit to their activity as a safeguard. Mr. Devine, editor of *The Survey* and an eminent social worker, proposed that the government should name some of the incorporators. Several newspapers of independence and ability, while welcoming the idea of the foundation, have expressed apprehension regarding unforeseen effects of this new tendency in "immortalizing" and arming corporations and self-perpetuating trusts for any and all forms of warfare on evil and disease, individual and social.

However, Congress is favorably disposed toward the proposition, and there is, to begin with, a guaranty of responsibility and rectitude, as well as of intelligence, in the incorporators named in the bill.

Big Ships, War Talk, and Peace

Our Secretary of the Navy, Mr. Von Meyer, declares that he "wants the United States to have the biggest battleship afloat"—a sort of super-Dreadnaught, so to speak. Why, if we are not to compete with England for naval supremacy, we should build the biggest of big ships, has not been satisfactorily explained. However, this appears to be a relatively insignificant matter. The important question is what our naval policy as a whole ought to be henceforth.

Shall we go on building two or more big battleships a year, to say nothing of cruisers, destroyers, submarines, airships, what not? Or is it safe and rational to stop now and limit our navy to its present strength?

It has been observed that whenever the naval question is "up" in Congress, and some men venture to advocate retrenchment and economy, war scares are created by certain newspapers or politicians; and the suspicion has been expressed that possibly certain interests, with an eye on contracts, are responsible for this strangely "opportune" war talk. Either Germany is "the enemy" to watch, or else it is Japan. Latterly, there has been much alarmist talk of an inevitable struggle with Japan—a "struggle" to sensation-mongers always means war—a struggle over trade in Manchuria, over railroad building in China and other opportunities, over investments and loans on fair terms, over the open door and alleged violations of it by means of manipulated railroad tariffs, rebates, etc. There was nothing tangible on which to base a complaint against Japan, and our State Department has not encouraged the talk alluded to, but in some quarters it has been eagerly exploited as furnishing arguments for more ships and larger appropriations for defence.

Among those who have protested against the agitation and the scare is Mr. Tawney, the chairman of the House Appropriations Committee. He was reported as saying:

"In view of our geographical isolation, which, as a means of national defence, is worth more to us than the largest navy any nation in the world possesses, and also in view of the fact that in the fiscal year ended June 30, 1909, we expended seventy-one per cent. of our government revenues on account of wars we have had and wars we are preparing for, it is rather amazing to find a naval program proposed that will so greatly increase our appropriations under this head.

"We are at peace with all the world. There is not even a prospect of our becoming involved in war with a foreign nation. It seems almost incredible that anyone would suggest the adoption of a naval program which will involve the expenditure of more money than we have under existing revenue laws, and a policy, too, which will virtually put out of commission at least half our warvessels by making them inferior in size in comparison with those giant battleships now proposed."

There is nothing new in this line of argument, for

the peace societies have iterated and reiterated the same truths on all occasions. The amount the United States, the least "exposed" and the most independent of nations, spends on "defence" and on war pensions is, however, realized by few, and those who urge more and more liberal naval expenditures prefer not to dwell on the question of the total cost of our military establishment, including pensions. We hear of the military burdens of Europe, "the armed camp;" the United States is not an armed camp, and has no rival to compete with furiously in ship-building. We have no questions that cannot be settled by diplomacy and moral authority, reënforced by the exporting nations. Why should we permit insane or silly talk of war and danger to affect our naval policy? And why should respectable publications print idle and ignorant gossip regarding alleged "threatening" complications with China or Japan when not a single solid fact can be cited to support the sensational statements? Japan and Russia were entitled to reject the proposal to neutralize the Manchurian railroads. There is no unfriendly act or intent in such rejection. The disputes over new railroads in that province are worthy of study and consideration, but they will not lead to any grave misunderstanding. They will be adjusted sensibly and calmly, without violation of treaty rights.

Old-Age Pensions for France

For three years the French government and parliament have wrestled with the difficult problem of providing old-age pensions for "veterans of industry" without bankrupting the national treasury and overburdening the already severely taxed classes of the population. The English old-age pension scheme, which involves no contribution from the beneficiaries or their employers, was considered in France and rejected as too costly and inexpedient. Almost at the outset the French statesmen in charge of the measure decided to insist on contributions to the pension fund from employers

and employes, in addition to that from the state itself. And this principle has been adhered to throughout the slow progress of the bill, which has but recently received the approval of the moderately progressive and powerful senate.

The French old-age pension system will benefit some 17,000,000 persons, it is estimated. It applies to wage-earners, urban and rural, and to small tenant farmers. Miners, railroad workers, and seamen, however, are provided for by other statutes and are not within the purview of the old-age pension measure. The full pension, which cannot exceed $82 a year, will be paid to men or women of 65 who have contributed to the fund for thirty years. But at the age of 55 a similar annuity may be paid to applicants —an annuity to which the state contributes nothing, and which represents the sum paid in by the beneficiaries and their employers. The state treasury will contribute to each final pension a sum equal to the contributions of the beneficiary and his employer. The cost of the scheme to the state is estimated at $30,000,000 a year. However, this total will not soon be reached, and, moreover, the law is not compulsory as to tenant farmers and others whose needs are not as urgent and great as those of wage-workers in manufacturing industries. Pensioners will have about $20 the first year after the act takes effect, and the amount will gradually increase.

The old-age pension system will redeem a pledge made to the masses of the Republic by all the progressive groups. The reform has been delayed owing to the budgetary problems of the Republic and the heavy annual deficits which it has had to face. An unusually prosperous year has, however, improved the position of the national treasury, and the last opponents of the pension plan were forced to surrender. Fresh taxes are to be levied in any case, and it will be easier to defend them before the country in view of the adoption of a great social and industrial measure like the old-age pension act.

Little has been said in France about the alleged danger

to thrift and economy lurking in civil pensions. The French are the thriftiest people in Europe, and many writers have accused them of carrying thrift to a degree that makes it a vice, especially in its effect on the size of the family and the natural increase of the population.

Two Programs for Reform of the British Lords

Whatever may happen in British politics and finance, one thing was decreed by the last general election—reconstruction and democratization of the upper house. Many of the lords themselves recognize that their house must be mended if it is to escape abolition. The bourbon element among them is large, but it is no longer noisy or influential. The leaders realize that the inevitable must be gracefully accepted and the growing spirit of democracy met at least half way.

Two programs have been presented for reform of the upper chamber. One has been approved by the peers and is comparatively mild. Lord Rosebery, former liberal premier and independent, is its author. The other plan, tentative and incomplete, is the Asquith or official liberal plan. It is deemed altogether too radical by the lords and is certain to be rejected by them. At any rate, they will not indorse it without first forcing another election and an appeal to the country.

The Rosebery program was given to the lords in the form of three distinct resolutions, as follows:

"That a strong and efficient second chamber is not merely an integral part of the British Constitution, but is necessary to the well being of the State and the balance of Parliament.

"That a second chamber can best be obtained by reforming and reconstituting the House of Lords.

"That a necessary preliminary to such reform and reconstitution is the acceptance of the principle that possession of a peerage shall no longer in itself give the right to sit and vote in the House of Lords."

The third resolution is undoubtedly significant, albeit it is not as "revolutionary" as it seems. In a sense it renounces the hereditary principle or basis of the upper cham-

ber, and its effect will be, under any plan of actual reconstruction, to reduce the membership and keep two or three hundred obscure and mediocre peers out of the house. But, as the tory lords have pointed out, the resolution does not mean that anyone who is not a peer can sit in the upper house. It merely means that the English peers will send "representative peers" to parliament as the Irish and Scotch peers do now, and that a certain number of peers will be selected by various public bodies—city and county councils, for example—to sit in the upper chamber, perhaps as life peers only. The Rosebery plan aims at making the lords stronger and more influential, to put more persons of ability, experience, distinction, achievement into that chamber and to increase popular respect for it. As to the powers of the lords, it would leave them intact. If, Rosebery and his supporters reason, a second chamber is necessary and desirable, and single-chamber government perilous and impossible in Great Britain, it follows that the second chamber should be something more than an ornament or superfluity or sham. An important and insignificant second chamber is worse than no revising chamber at all.

The liberals, radicals, laborites and Irish nationalists are not satisfied with the Rosebery program and the concessions of the lords. Many of them admit that a second revising and steadying chamber is desirable as a protection against "gusts of popular passion" and impulsive or demagogical legislation. Premier Asquith's resolutions represent a compromise between the moderate and the advanced elements of the liberal-radical party. They are stronger and bolder than the anti-lords resolutions passed the commons some years ago, when the late Campbell-Bannerman was premier. There are three of them. One declares that the peers must be prevented "by law" from rejecting or amending money supply bills, or budgets; another sets forth that in regard to legislation of a general character the lords shall be deprived of the absolute veto, and that any bill passed by the commons at three successive sessions shall become

law without or against the consent of the lords; the third resolution limits the life of parliament to five years instead of seven, the present term.

These resolutions, if approved by the voters at an election, will "curb" the lords and greatly reduce their power in every important direction. They will be able to delay legislation, force deliberation and thorough consideration of measures, but their veto will be a thing of the past. In that event the mere reconstruction of the lords by changing the basis of representation or reducing their number, will lose much of its importance. Even if they were not mended at all, the disappearance of the veto would change the whole situation. Liberal ministries would be able to enact their measures after a delay of a year or two, and the lords would cease to be a sort of tory opposition when the more democratic and progressive party was in power.

The Political Drift and Parties

Many Democrats hope and many Republicans fear that next fall the House of Representatives will be captured by the party that has so long been in a minority. President Taft himself frankly expressed the apprehension, from a party point of view, that the next House will be Democratic. The same talk has been heard in Congress, in local political gatherings on the street. "The Republican party is busted," says one leading independent editor. "The Republican party must clean house and purge itself," say Republican leaders, "for if it does not do this the people will repudiate it at the first opportunity."

Among the "signs" pointed to by all such observers are the results of congressional "by elections" (caused by deaths) in Missouri and Massachusetts; the growth of the insurgent movement, the failure of a few Republican district conventions to indorse the new tariff, the bribery scandals in New York, the severe criticisms of the Taft administration in the press, the pro-Roosevelt movement.

The dissatisfaction with the administration is due to the tariff, the cost of living which is ascribed in part to excessive protection and the manipulation of trusts, the Pinchot-Ballinger controversy, and several minor causes, including injudicious oratory on the tariff and its alleged "blessings." Even organs friendly to Mr. Taft personally are candidly discussing the loss of confidence he has suffered and advising the administration to adopt a more aggressive attitude toward the reactionaries.

Meantime "the impending Roosevelt," to use the expression of a magazine writer, is the topic of the hour. The former President's triumphal march through Europe has naturally further enhanced his prestige and popularity, and the talk of his candidacy in 1912 for the chief magistracy is open and general. That he will be nominated and elected by the Republicans is freely predicted by many, including Democrats and independents—and this in spite of Democratic gains. Mr. Roosevelt has absolutely tabooed American politics; none of the correspondents who have followed him since he emerged from the African wilderness has been able to obtain a hint from him as to his view of the situation in this country. Is he displeased with the tactics and actions of his successor? Is he in sympathy with the Republican insurgents and progressives, or is he with the "regular" Republicans in their insistence on discipline and unity at any cost? Will he take active part in the congressional campaign? All such questions, which are by no means purely personal, must remain unanswered for the present. But they were the subject of endless speculation and gossip, and they serve to make the political situation extraordinary and anomalous.

Leaving them on one side, what is Congress doing for the insurgent voters? Little, if anything. The so-called administration bills, the measures supposed to embody the constructive and progressive policies to which the party in power is pledged, are not advancing toward enactment. The opponents of conservation are complacent and say boldly

that none of the several conservation bills will be passed at this session. The much-amended railroad-rate and interstate commerce bill is under progressive fire. The postal savings banks bill is meeting with powerful opposition in the House. The bill regulating labor injunctions is denounced as hotly by the workmen and unions as it is by the employers' association, for whatever its real merits may be, it will reflect no credit, from the electoral point of view, on anyone connected with it. The fate of the statehood bill is in doubt. Clearly, Congress is not doing much to reassure and conciliate the voters. No wonder an "explosion" is feared.

The need in public and party life is courageous leadership and fearless warfare on corruption, special privilege, graft, spoliation. The exposures in Albany, Pittsburg, Chicago, San Francisco, and elsewhere show that "the enemy" is the seeker of monopoly and favor, the greedy corporation or individual that is willing to buy legislation and undermine the foundations of civil society and government. The revolt of the voters is not a party revolt; it is a revolt of conscience and intelligence against dishonesty, predatory plutocracy and base betrayal of the people by legislators and administrators. This revolt is assuming the proportions of a moral and political "revolution." It will make and mar fortunes and issues, and it will compel novel and drastic legislation, state and federal.

IX. Woman's Influence on Civilization*

By George Willis Cooke

ONE of the greatest biological and sociological problems now before us is that of sex, and it has by no means been solved as yet in either field of inquiry. We know that sex has served a great purpose in the evolution of the higher forms of life, and that it has been fundamental to the growth of man physiologically, socially and ethically. It began low down in the evolutionary process, and no higher organisms appeared until it was well established. Its differentiation or division of labor seems to have been essential to all forms of progressive life, not only biologically but socially. Precisely why life could not have been reproduced parthenogenetically (by one sex), as in the lower forms, we do not know; but evidently there was some large advantage gained by the division into two sexes.

We also know that children inherit equally from the mother and father, and that in so far as heredity is concerned the male has no advantage over the female. The theory that the child originates wholly with the father, and that the mother is only a matrix for its growth, has no foun-

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dation in fact. Equally wanting in truth is the theory that the soul originates with the father and the body with the mother. The patriarchal social system was based on the first of these theories, and in its later stages accepted the second. The headship of the father in the family was supported by this theory down to the period of modern biological science. The complete falsity of this biological conception has undoubtedly had much to do with the weakening of the social doctrine which grew out of patriarchalism.

The child not only inherits equally from the mother and the father; but in its nurturing or training the mother's influence is fully as large as the father's. The great debt which many men express themselves as owing to their mothers would decisively indicate that the influence of the mother upon childhood and youth is even larger than that of the father. The teachings of modern psychology in regard to the plasticity of the child's mind, as well as to the importance of suggestion and imitation at this period of individual development, show why and how the mother impresses herself upon her children, as the woman teacher does upon those under her tuition. In the early periods of social life, when human institutions were in the making, the mother must have been a not less potent factor in the training of her children than now, limited only by her own lack of effective knowledge. Even in those periods when the woman was shut into her home or confined in a harem, as is the case now in many eastern countries, the mother's influence must have been effective in many directions; if in no others, then in the perpetuation of her own superstitions and social prejudices.

In all the early ages of human history practically all women were married. In Rome there were vestal virgins, few in number; and elsewhere small companies of women were to be found living outside married life. Early Christianity favored virginity, and conventual life gave occupation to women who were not attracted to domestic duties. It was true, however, in all the early ages that marriage

was accepted by all women; and even when the convent was the most largely attractive to women, the great majority found their place in the home as wife and mother. Even in the American colonies down to the time of the revolution, and even later, unmarried women were almost unknown. It is under modern economic conditions that a large number of women have come to live outside marriage and the convent. Therefore the present-day problem of work and wages for women is largely a new one, scarcely known before the eighteenth century, except under special and temporary conditions.

Back of all modern facts as to the character and position of woman, however, is that which makes her unlike man. Woman differs from man in body and mind, whatever may be said in regard to intellectual truth being always the same without regard to sex. This distinct difference is the result of the fact of sex, and that in the sex-life of woman her functions are not the same as those of man. Sex is of such a fundamental nature that it pervades and dominates the whole of the body and mind alike, and shows itself in every action, feeling and thought. Woman's nature has been shaped with reference to the duties of motherhood, the bearing and nurturing of children. The surplus energies of the woman's body, those not essential merely to nutrition, are such as fit her for maternity. In order to bear and nurture her child she has need of those reserve forces necessary to its growth and feeding, and also those which make her capable of long hours and days of patient watching and care. She must be capable of sitting at home, contented to live only in her child, ready to meet its every need. A life such as this requires vast reserve forces, large qualities of endurance, and a passivity of body and mind making these qualities possible. Nature has fitted woman for this task by endowing her with the qualities wrought out in the experiences of all past mothers, animal and human. Putting aside the physiological fact that men cannot relieve women of the task of bearing children, and there-

fore of renewing the race, we have only to imagine the care children would receive if men were their nurses or what the home would be if men were its creators, in order to recognize the important social functions which fall to women. A knowledge of the life men live in connection with all those occupations which debar the presence of women, such as those of the woodman, sailor and soldier, will indicate very definitely what mankind owes to womankind in the creation of the home. Not only as a fitting place for the growth and nurturing of children, but also for the training and humanization of man, the home is of the first importance in the evolution of civilization. It is not mere sentiment, and it is not gross exaggeration, therefore, to assume that we owe to women the creation and perpetuation of the greatest and most effective of all human institutions.

It has been impressed upon men in all countries and ages that woman's life is static where man's is dynamic, that hers is passive and his active. In the early Chinese works devoted to customs and laws, known as the Kings, this relation of men and women is elaborately defined, not only in positive laws, but in a series of symbols. Heaven is male and superior; earth is feminine and inferior. Heaven rules, earth obeys. As heaven is to earth, so is man to woman. In India the Code of Manu, the earliest collection of customary laws, preserved by tradition from unknown ages in the past, has the same teaching as to the superiority of man and the inferiority of woman. His superiority fits him to command, her inferiority fits her to obey.

Modern science repeats these old teachings in a new form, not actually claiming that woman is man's inferior, but asserting that man is progressive, woman conservative; man the source of individual variation, woman of racial continuity; woman static, man dynamic. It is doubtful if the new teaching is in any degree more valid than the old. There is no real proof that woman is less variable from an evolutionary point of view than man, though it may be admitted at once that the variation does not express itself

in the same directions. What appears in the males as horns, colors, greater size of body, a larger gift of invention, and an endless number of other qualities, shows itself in females as adipose tissue, mammary glands, greater physical endurance, power of patient continuity at a single fundamental task, and no end of other qualities which are designated by the word femininity. In the economies of nature or of biological development the qualities we designate as feminine are fully as fundamental and important as those designated as masculine. In so far as any proof now exists, the feminine is as great a source of variations as the masculine. If mankind owes great and varied services to the father, it owes not less great and varied services to the mother.

The differentiation of the sexes is undoubtedly the source of that division of labor which we find existing from earliest time as between man and woman. As we saw in our first article, the primitive man hunts, fishes and makes war, while the woman provides the home, cares for the children, gathers seeds, and domesticates plants and animals. The natural functions of fatherhood and motherhood have become the cause of the social functions of provider and sustainer. The man has control of production, the woman of consumption. In the economies of the home-life the one function is as important as the other. Her passive, child-bearing qualities fitted woman to control the arts of consumption, as man's active, aggressive qualities fitted him to control those of production.

In the maternal ages we find woman carrying on the great tasks of child-bearing and training, making the home, domesticating plants and animals, inventing the beginnings of agriculture, and establishing in their earlier forms the arts of social and political life. Up to this point in the progress of civilization, which is chronologically far on in the career of mankind on our planet, we find that the services rendered by women were fully as great as those rendered by men. Why this auspicious beginning was not continued without interruption we may find it difficult to un-

derstand. It was assuredly the result of the peculiarities of the two sexes in their relations to each other; but, admitting these differences, and the manner in which they work themselves out in social and industrial life, it is puzzling to find that women did not keep even pace with men in their direct effect upon the successive stages of civilization. The cause of this apparent failure of women's influence is to be found partly in economic and partly in psychological reasons. When the population became great enough so that the natural products of the earth could be no longer depended upon for food subsistence, men took up the work begun by women, increased their flocks, and developed agriculture. As a result, agriculture became the cause of polygamy, that the man might have many workers in his fields. Jealousies between tribes, and the sources of plunder provided by flocks and granaries, led to the development of war. In time it was found more advantageous to preserve the lives of those captured in battle, and to put them to the tasks of the fields, thus relieving women of agricultural labors. When agriculture and other arts had advanced somewhat, in warm productive lands, cities began and commerce appeared. We find, then, that hunting, war, slavery, and competition have exercised a potent influence on the lives of women, and that as hunting was left behind, and higher forms of economic life appeared, these causes determined for women new relations to men. In connection with these economic causes we must recognize those growing out of morals and religion, family ideals, and traditional theories as to woman's nature and functions.

We can easily imagine how much more happy would have been woman's career, and how much more effective in the advancement of civilization, had the shut-in life of the home and the harem never been hers. Had education from the first been open to women as to men, had women been free to engage in any occupation or profession as they are now in this country, how much better it would have been for them, as well as for men! But we have not to deal

with what might have been, only with what has actually occurred, in so far as we can discover it from the dim records of the past. We must assume, then, that for a very long period descent was reckoned on the side of the mother. The process of the transference of descent to the father was a very slow one, but it brought about a revolutionary change in the position of woman. It brought her into subordination to man, and her life in some respects became similar to that of the slave. In fact, slavery and war were undoubtedly potent forces in determining woman's position during the patriarchal period. The complete dominance of man had many far-reaching effects which continued down to the modern era, and are as yet only modified, not outgrown. One of the most evident of these effects is seen in the physical inferiority of woman. In the early ages, among primitive races, and among peasant and other women who live an active out-door life, and share in the occupations and interests of men, they are nearly as strong and vigorous as their masculine companions. They can accomplish as much work and as easily; and in the case of conflict with men, the women stand an equal chance of coming off victorious. The evidence for this conclusion is so large in amount and varied in character that there can be no doubt as to its correctness. Already, under modern conditions, two or three generations have been sufficient to recover to women something of this early robustness and vigor.

The patriarchal theory developed a feministic type of woman, delicate of body, nervous and hysterical, and with the clinging-vine qualities much admired by many men. Leading a shut-in life, waited upon and watched over by slaves, given neither culture nor occupational interests, she became an intellectual dependent, and cultivated chiefly the arts of subterfuge and intrigue. Most of all, she developed the sex attractions of beauty, delicacy and fascination, which literature has described as the chief characteristics of women. The result has been that women have not kept pace with men in physical robustness or mental vigor. In this

Mrs. Julia Ward Howe.

Lucy Stone Blackwell.

respect patriarchalism has done humanity a very great injury, and one it will take many centuries to outgrow. While men continue to select the women who are delicate and sexually fascinating the race will continue to degenerate. Now that a considerable proportion of the women of all civilized countries do not marry or bear children, such selective process is continually going on. Pearson has shown by ample statistics that one-fourth of the women bear one-half of the children, therefore what these women are will have great effect upon the next generation, not only physically but mentally. It has been shown by Galton that the monastic and conventual life, by selecting the most intellectual and spiritually-minded men and women for celibacy, had a degenerating effect upon the medieval age. The barbarian characteristics of that period, we must suppose, were in no small degree due to that cause. At least, the men and women most capable of resisting these tendencies had withdrawn into a safe retreat from the discords of the world around them.

Another evil effect of patriarchalism was the creation of two types of morality, the free license of men in polygamy and concubinage, and the rigid purity demanded of women. Under these circumstances men added insult to injury by attributing to women an impurity which they do not show under normal conditions. This double morality emphasized the feministic qualities of women, increased the demand for women of this type, and gave excuse for a still greater degree of subjection for women as to property,

Mrs. Pankhurst, the Militant Suffrage Leader, Founder of the Women's Social and Political Union.

the range of occupations open to them, and rights in the children they have borne. It is evident from any careful survey of the subject, not only that the double standard is the result of patriarchalism; but that it must be wholly abolished before a single standard can be secured in all phases of the relations of men and women.

It must be fully recognized, of course, that the patriarchal system was effective in the evolution of the monogamic family and in the establishment of the home, at least, in so far as women were concerned. It may be questioned, however, whether these were not secured at too great a cost to women, and by methods not at all essential to their permanence. Women continued to have a large influence in the training of children, not so great as it ought to have been, because they were too ignorant to give a wise teaching; and because the period when children, especially boys, were under their care was a limited one. Nor is it to be as-

Jane Addams.

sumed that all women were shut out from labor and the active interests of life. The women of the slave class were not delicately reared or protected by their masters. Plebeian women, and the wives of farmers and peasants, as well as of mechanics of all kinds, were obliged to labor, and to live much out of doors in the pursuit of their work. Their life of toil saved them from many of the physical and intellectual disabilities of the women of the aristocratic class.

Through all the patriarchal ages there were women who rose to fame. Many queens ruled in Egypt, and in various oriental countries. If some of these were legendary or mythical instead of real women, the power attributed to them testifies that women were not debarred from the right to rule when opportunity come for them to do so. The literary women who succeeded Sappho in Greece, though they gained nothing of her fame, yet testified to the possibilties of their sex, hal the conditions been more friendly to them. The salon of Aspasia has been surpassed in no subsequent aeg. In later Egypt Hypatia secured recognition for learning and eloquence. Many Roman women in all periods showed their ability to counsel and encourage the men who were their husbands and friends. During the period of early Christianity women showed capacity for every phase of activity in behalf of religion, and had it been more liberal in accepting their services they would have rendered it far larger and more efficient support. Restricted as was the environment of most women, in the several periods of the ancient world, these instances prove that

Selma Lagerlöf, celebrated Novelist and Winner of a Nobel Prize.

Madame Curie, the famous French Physicist.

Mrs. Fawcett.

Mrs. Humphrey Ward, celebrated English Novelist.

the subjection was by no means complete, and that even under adverse circumstances some women will make their talents shine.

The Renaissance opened up a new era in the progress of women under civilization. This movement was in two directions, (1) towards a greater freedom to the individual, and (2) towards a greater extension of the functions of the state. The one was correlate of the other, though it is probable that the individualistic movement was the earlier its development and in its historic expression. Fundamentally, these movements are one and the same, and are only two phases of the same tendency. It is impossible that they should proceed without each other, for neither can under any circumstances find manifestation alone. The precedence of individualism in definite expression was partly owing to the preservation of that freddom of women characteristic of the Germanic tribes. In the growth of patriarchalism this freedom had not been obliterated, as was the case elsewhere, in some part the result of the rapid extension of Christianity, and perhaps even more largely the outcome of the economica condition incident to the expansion in industrialism. With the growth of the state, result of the evolution of modern languages, the dependence of economic and industrial interests upon each other, and extension of the means of communication and travel, there bega nan ever-extending oversight and control of the interests of the individual. Women and children have especially profited by this enlargement of the functions of the stae, which is still proceeding at a rapid rate; and is destined to a far greater expansion in the future.

As the state has grown, and has come more and more to recognize that it is the organ of a collectivity, it has subjected all lesser institutions to its own control or to its own guidance of them in directions fulfilling its own purposes. The state no longer permits the feudal class or the industrial class to follow exclusively their own interests of what they conceive to make for their own welfare, without restriction. It interferes between the lord and his tenants, to insure to

the tenants agreater protection. The lord can no longer turn the peasant out of his home in obedience to his own caprice or to his own personal advantage, without redress; or subject him to extortionate rents at his own will. The state also intervenes between the manufacturer and his workmen, to regulate hours and wages, to secure sanitary conditions of toil. Although much yet remains to be accomplished, in order to insure the fullest protection of the peasant and the worker, there can be no doubt that the state has greatly widened the scope of its activities with the growing complexities of modern life. The greater the number of activities and interests, and the greater their complexity and interdependence, the more widely has extended the power of the state in its control of all human relations. At the same time, this intervention of the state has become more and more the source and basis of individual initiative and freedom. The two are inseparable. Freedom and initiative do not grow where the power of the state is absent, but only in connection with it, and as one of its most desirable results. This simple fact is too often ignored by men who claim that freedom grows from roots of individualistic assertiveness, a conclusion which history does not in any degree sustain. The measure of state expansion is the measure of freedom for men and women alike.

The modern state does not interfere with the intolerant acts of the manufacturer and mine-owner for the sake of extending its own power, but that the individual who cannot defend himself may secure juster recognition of his rights and more of freedom. Behind this expansion of the functions of the state is the evolution of the conception of a common life, that the interests of each are bound up with the interests of all, and that the protection of the weak is for the benefit of the strong, as well. If the strong will not protect the weak from recognition of their own higher interests, or because of the motives of religion and ethics, then the state must intervene to secure the welfare of all. As the welfare of all is the very foundation of the life and

prosperity of the state, there is no other course for it to pursue, if it has regard to its own perpetuity, than to justify its own existence by that control which insures that the interests of all shall be amply protected and furthered.

This extension of the functions of the state, and this new conception of the worth of the individual, have alike served the interests of women. The extension of the state has overthrown patriarchalism, and has secured to woman a large degree of recognition for her individuality. She can now own property, control her own child, and enter upon any career she may choose. If these and kindred enlargements of opportunity have not reached their amplest form, it is because the state has not yet advanced to the full recognition of its functions as the expression of the collective life of the nation. Undoubtedly this tendency will go on until a woman will be as free as a man, and possessed of the same privileges and opportunities. It is evident that this change will be for the benefit of men and women alike, and that it will insure to the state greater worth and stability.

Such a reconstruction of social and political interests must of necessity lead to various temporary evils, and raise many problems not easily solved. It will seem to threaten the family and to promise the overthrow of the home. Apparently it will make women discontented with child-bearing and home-making, to which custom would restrict them if they become wives and mothers. Undoubtedly these evils will exist, for every great social change requires time for adjustment, and for the establishment of those habits and traditions which secure the best results of its operation. Greater freedom for women has increased the number of divorces, and it has made some women rebellious against the unjust conditions under which they are now compelled to live. It is not possible, however, to put women back under the old patriarchal conditions, now that they have enjoyed a greater degree of freedom. The only way of promise for the future is to be found in a still larger degree of freedom and opportunity to women.

When we look back over the past, and realize the nature and extent of the disabilities under which women have lived, and compare them with what women now are and with what they are now accomplishing, we cannot but assume that civilization would have advanced far more rapidly had the same degree of freedom and opportunity from the end of the maternal age been accorded them, to the exclusion of the patriarchal theory and method. We realize, however, that in all probability this could not have been secured; but such a thought compels the wish that nothing may intervene to hinder the steady progress of women to a just and wise solution of the problem of their relations to men and the state.

Any genuine study of the remarkable changes which have come about in the position of women since the Renaissance must convince us that women have made large contributions to civilization, and that they would have been far greater had they been in possession of the resources of education to the fullest extent. What they have actually accomplished, considering the limitations under which they have secured their training and done their work, makes it certain that they will reach to far higher results in the future. The opening of the avenues to education and culture has not only much enlarged their fitness to undertake the training of their own children, but fitted them for the general work of education and for an active participation in the world's activities. While it is true that there has not been as yet a female Plato, Shakespeare or Darwin, yet women have done excellent work in many fields of activity. In fiction they have reached almost the highest levels in the works of George Eliot, George Sand, Harriet Beecher Stowe, Selma Lagerlöf and many others. In science Mrs. Somerville, Sonya Kovalevsky and Madame Curie have done work fully as important as that of any man except the few great masters of original research and interpretation. In the fields of general culture and literary expression such women as Madame de Stael, Frederika Bremer, and Julia Ward Howe have

done work of first-rate importance for their own time. The women who have been leaders in demanding larger recognition for their sex, such as Mary Wollstonecraft, Mrs. Fawcett, Mrs. Pankhurst, Lucy Stone, and Susan B. Anthony, are deserving of generous recognition as pioneers of a higher culture and civilization.

It is not necessary to attempt any more extended enumeration of what has been accomplished by women under the conditions of the greater freedom of modern life. However detailed such a statement might be made, it could be no more than "a foretaste of things to be." It is evident that women are only at the beginning of their real career. What they can accomplish, that for which they are best fitted, in what and to what extent they differ from men in their mental operations and capacities, are all problems to be tested and determined. Advanced as civilization is today this is a strange statement to make, that one-half of mankind is only now finding its own capacities and place. And yet this is a simple statement of truth, a statement which may be accepted as a fact or as a criticism, as the reader chooses.

Looking toward the future, but yet mindful of the whole past history of mankind, we see before us certain results to be worked out for and by women. These are not merely utopian ideals, but solid realities already in part developed as phases of the civilization of our own time. We may enumerate some of them as legitimate results of our study of woman in the progress of civilization.

1. Complete recognition of woman's individuality, and the adjustment of the family and home thereto. This does not mean that women will refuse to marry or that they will fail to regard home-making as offering them the highest opportunity to which they can be called. It does mean, however, that women shall cease to be under tutelage, that they shall be free to follow the call of their own capacities, and that as appertains to the family and property the law shall treat them as on a basis of fullest equality with men.

2. The fullest recognition that if a woman marries, bears children and creates a home, her contribution to the family life is equal to the man's, and should be so guaranteed in their financial relations. This means that the family shall cease to be an autocracy with the man as dictator. In considerable degree this change has already come about, not only practically but legally; and the family is now based as never before on affection, common helpfulness, and the recognition that the partnership is one of equal responsibility and obligation.

3. The opening up of all occupations and professions to women, the equalization of remuneration for the same work, and the freest opportunity for women to select that for which they are best adapted. It cannot be doubted that if all doors of opportunity are thrown wide open to women, without prejudice and social restriction, they will soon find their own places, and be fully contented with them. Such freedom is now accorded women in the teaching profession, though not always do they receive equal remuneration with men performing the same work. The result is that to a large extent they secure the places in that profession for which they are best fitted. Some other occupations they now occupy almost to the exclusion of men, not only because they are better fitted for them, but because they perform the same labor for less money. Judging from early conditions, and from the present greater devotion of women to religion, it may be properly assumed that they are naturally better fitted for its affairs than men; but prejudice keeps them from this calling, which they ought to occupy as freely as that of teaching. In time women will find their own level in all occupations, and will seek only those to which they are adapted. Even then, however, individual women ought to be free to undertake such work as circumstances or inclination may open to them. It is not probable that many women will enter actively upon the work of the farmer, but there is no reason why individuals should not succeed in the duties of that calling.

4. The double standard of morality, result of the prevalence of the patriarchal system for several thousand years, should be changed for that of the single standard or that now accepted by women; and this for the advantage of men and the family. It is evident that the family cannot reach a high level of happiness, purity, affection and mutual coöperation until the double standard has been abolished. No legal enactments alone can secure the general acceptance of the single standard, but the law ought to make no distinction whatever between men and women. The fault is in those social ideals and privileges which men have assumed as the result of patriarchalism and autocratic rule. When the state ceases to give men monarchical rule over the persons of wife and children the double standard will disappear. Men ought to adopt a new standard, which will fully recognize the baseness and cowardice of demanding privileges which do not also belong to the woman they love.

5. The future will undoubtedly bring to women full political equality with men, as the final assurance on the part of the state that it guarantees their ample protection and the largest recognition of their right to share in its activities and responsibilities. It is not because of any metaphysical "rights" that suffrage should be guaranteed to women on the same conditions as to men. Women are persons in every sense in which men are, and they have as much need that duties and privileges should be accorded them. The suffrage grants them recognition, responsibility, and the means of protection. They cannot depend on chivalry or the sense of duty in men to secure them such protection and opportunities. Women are not as men, whatever may have been claimed by early suffragists. It is precisely because women have other interests than men, see life from another point of view, with greater regard to children, family, home, morality and altruistic demands, that it must be well for the state to secure the aid of women in its great tasks, by according them voting and law-making

privileges. It cannot afford, in very many directions, to go on without their active coöperation. Indeed, the state must come to demand, in the not remote future, that women shall lay aside their prejudices and their restricted interests to share in making it correspond to the needs of all who come under its control. The objections to these broader activities on the part of women are based almost wholly on tradition. They do not grow out of the actual needs of men and women at the present day. When war was the universal occupation of socially superior men the objection that women are unfitted for the soldier's life was a valid one. Such an objection today has no meaning whatever for the men who recognize the larger social demand, that the state shall become the expression of the will of all the people. The claim that the exercise of the suffrage, and the advising as to what is best for the state as the organ of the people's needs, will unfit women for motherhood and home-making has been amply proved to be without any just grounds for reiteration, in the experiences of such communities as have already given women these privileges. We may be sure that in time these and all other objections will be seen to have no validity, and women will take their places in helping forward the world's larger social interests, with happy results to the family, and with a fitting enlargement of the personal and social opportunities of womankind.

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IX. Nubia*

By James Henry Breasted

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OVER on the Island of Elephantine the natives speak a language very different from the Arabic of Egypt. Their language is the ancient Nubian, a tongue related to dialects of inner Africa extending as far as Kordofan. In the days of the Pharaohs it was the language of the cataract region and it still survives there. Strategically considered the Nubian Nile is the road into the Sudan. With its thousand miles of cataract-bound country it has been a historical link uniting inner Africa with the ancient civilizations of the Mediterranean region. In spite of the difficult cataracts, it has been for over five thousand years the commercial highway along which the gold and ivory, the ebony, panther skins and ostrich feathers of the Sudan passed northward to Thebes, Memphis and the Mediterranean. We recall that from before 3000 B. C. it was the path of the Pharaoh's frontiersmen as they pushed up the Nile in the slow process of absorbing the cataract region. We are now to follow Harkhuf who brought back the pygmy, and Mekhu, who was slain by the barbarians, and Sebni his son,

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Earlier articles of this series were: I. "The Nile Dwellers and Their Land," September; II. "Alexandria and Cairo," October; III. "The Pyramids and Sphinx—Memphis and Heliopolis," November; IV. "The Voyage of the Nile—Abydos and Denderah," December; V. "Thebes: Karnak and Luxor," January; VI. "Temples and Tombs of Western Thebes," February; VII. "Esneh, El Kab and Edfu," March; VIII. "The First Cataract: Aswan and Philae," April.

who rescued his father's body. We are to see how the great river became the artery along which pulsed the influence of Egyptian civilization till it penetrated to the Fourth Cataract and beyond. We shall follow the march of the Pharaoh's army as it carried his power southward and made the country an Egyptian province as far as the foot of the Fourth Cataract. We shall see how the country took on a veneer of Egyptian civilization, as orderly towns administered as in Egypt became centers of traffic from the south. Those towns though now vanished, are still marked by stately temples of the Pharaohs, rising with surprising frequency along the shores of the river. We shall find there, too, the strange hybrid monuments of the post-Egyptian Nubians. For by the middle of the eighth century B. C. the decline of the Pharaohs was such that Nubia established itself as an independent kingdom, and even for a brief period absorbed Egypt and ruled the land of its ancient suzerain. These are the Ethiopian Pharaohs against whom the prophet Isaiah thundered in the streets of Jerusalem, and two of their names are mentioned in the Old Testament. They had their capital at Napata, called Noph in the Old Testament, at the foot of the Fourth Cataract. Driven from Egypt by the invading Assyrians, the Nubians finally retired to this capital, and later even farther south to their final residence at Meroe. Separated by vast distance and almost impenetrable deserts from the north, Meroe now became the seat of that remote and mysterious Ethiopian kingdom, known to the Greeks and Romans as the source of civilization on the Nile, a reputation which it maintained until two generations ago. As a matter of fact the Egyptian veneer slowly wore off as the country was more and more isolated from the civilization of the north, and it was thus thrown back upon the barbarism of inner Africa. It was a treasury official of this distant kingdom "a eunuch of Candace, queen of the Ethiopians," who was converted by the apostle Philip in the New Testament story (Acts viii, 25-40). For some centuries after the separa-

tion of Egypt these "Ethiopians," or as we now call them Nubians, continued to use Egyptian writing and language in state documents and on their monuments. By the third century B. C., however, they had developed a system of writing of their own; but in Christian times they began to use Greek letters for writing Nubian. Recently fragments of the New Testament in ancient Nubian written thus in Greek letters have been discovered, and on the basis of these materials the decipherment of the still undeciphered ancient Nubian is proceeding.

From the middle of the sixth century A. D., beginning at Philae, Nubia was rapidly Christianized, and the process continued till it included the kingdom of Aloa, a fragment of old Meroitic Nubia, with its capital at Soba on the Blue Nile, which survived far down into the Middle Ages. As Abyssinia at the sources of the Blue Nile had already long been Christianized from Arabia, there was an uninterrupted series of Christian powers from Abyssinia and the source of the Blue Nile northward to the Mediterranean. It was the southernmost reach of Christianity in early Christian history. It was by this means that Abyssinia inherited the title "Ethiopia," to which it has no proper claim; and it was in this age that Abyssinia first emerged into history, in spite of the vast antiquity which it boasts, even claiming to reach back to the patriarchs of the Old Testament. After its introduction into Egypt Mohammedanism pushed up the Nile and rapidly displaced Christianity throughout the south except in Abyssinia. Not a Christian was finally left on the Nubian Nile, and the churches fell into ruin, and the people into barbarism, till they were again made tributary to Egypt a century ago by Mohammed Ali, viceroy of Egypt. How they were again detached from the north and drawn into the maelstrom of religious fanatics under Mohammedan leaders in inner Africa a generation ago doubtless all are familiar.

While the north wind struggles with the current of the

lower cataract to carry us slowly past the palms of Elephantine, our dahabiyeh enters the wilderness of granite rocks and hills, as we begin the passage of the oldest frontier in the world. Those who wish may escape the tedious waiting at the great locks which lift our boat to the level of the lake above the dam, by spending the night at the hotel on Elephantine and rejoining the party at Shellal; but whoever does will lose one of the most interesting experiences of the Nile voyage, with which we would gladly tarry longer. As we issue from the uppermost of the four locks which have raised us sixty-five feet, we have before us the wide surface of the lake, dotted with granite islands, the peaks of former hills. The palms on these islands have almost all disappeared, but here and there, their fronded crowns just rise above the surface of the water like some strange and unknown aquatic plant. Otherwise the bare bleak rocks descend to the water without a trace of vegetation to relieve the desolate wilderness as far as the eye can discern the barren hills rolling to the horizon.

There is now no opposing current. The waters are quiet for sixty miles above the dam, and a day's sail of fifty or sixty miles is not uncommon. As the outlook up the lake opens southward the wide prospect is picturesque in the extreme. A few squalid villages displaced by the rising flood have found new lodgment on the bare rocks above. How they live is a mystery, as the scanty margin of soil which they formerly cultivated has now been submerged to a great depth. Headland after headland of granite rocks projects into the lake and between these open deep vistas of water extending far into the rocky desert. All the ancient remains have been covered or will be when the dam is raised. The government has appropriated funds and an archaeological survey of the cemeteries and temples affected by the lake is now being made. At intervals the colonnades of a ruined temple are discernible against the dark rocks. We leave the granite and the sandstone which we met above Edfu reappears. In the afternoon, if the wind hold, we

enter the massive Bab el-Kalabsheh or "Gate of Kalabsheh," beyond which is the village of the same name with two temples: one behind the village is an imposing structure erected on the site of an older temple in Ptolemaic and Roman days, but never entirely completed; the other far up the height, hewn out of the cliffs by Ramses II, contains remarkable reliefs depicting his victories over the Nubians, and the reception of the spoil which he brought back. Kalabsheh is thirty miles from the cataract; forty miles further south at Maharraka (ancient Hierasykaminos) is the limit of Ptolemaic power and the Ptolemaic temples abruptly cease at that point, but not before we have passed two more of them, Dendur and Dakkeh besides a grotto temple of Ramses II at Gerf-Hussein, and opposite Dakkeh the massive brick fortress of Kubban, which covered the Pharaoh's desert road from the Nile into the gold country of the eastern desert. Ramses II's sand-covered temple of Es-Sebua follows. In a country now containing but a few scattered villages of mud huts, whose inhabitants eke out the meagrest sustenance, these evidences of a great and prosperous past seem strangely incongruous.

Sixty miles from the dam at Wadi el-Arab, where the natives again for a short space speak Arabic, the elevation of the waters by the dam is still evident. Soon a sluggish movement of the water northward is barely discernible, a movement which increases to a real current above Korosko, eighty-seven miles from the dam. Rounding the sharp Korosko bend with difficulty and often with long delay, we pass the small Eighteenth Dynasty temple of Amada, with exquisite reliefs and its great historical stela of Amenhotep II, whom we beheld still lying in his tomb at Thebes. It is this Amada inscription in which he boasts that no man could draw his bow, and tells us of his conquests from the Euphrates on the north to Napata at the foot of the Fourth Cataract on the south. This is the earliest mention of Napata in the inscriptions. A much ruined temple of Ramses II at Derr, the Eighteenth Dynasty grottoes at Ellesiyeh

and the tombs of Anibeh bring us at last to the ancient fortress of Ibrim, perched high on the cliffs of the east shore, from which an imposing prospect of the desert and river stretches far to the north and south. The narrow fringe of palms and other vegetation along the river and the wide expanse of rocky wastes and sandy valleys contrast sharply. All along the west shore a deposit of alluvium seven or eight feet deep is visible in section where the river has cut through it; but the sands of the western desert have driven in and covered it often several yards deep. For hundreds of miles this invasion of sands from the west has engulfed the narrow fields of the valley down to the water's edge. Ten or twelve miles southward on the horizon we descry the village of Toshkeh, marking the northernmost advance of the Dervishes, the high water mark of that tide of religious fanaticism under the Mahdi, which threatened to inundate Egypt. It was stopped at this point by an Anglo-Egyptian force under Gen. Grenfell, who defeated a large body of the Dervishes near Toshkeh, on August 3rd, 1889. Thus the forces of barbarism and civilization have contended on this oldest of frontiers from the days of the earliest Pharaohs over five thousand years ago down into our own time.

From the heights of Kasr Ibrim the dahabiyeh seems like a toy boat. We clamber down the naked rocks filled with wonder at this prospect of a river of life issuing from the heart of Africa and wandering like an interminable oasis through a realm of death. A day's sail southward and we discern a long vista of river terminating in a splendid promontory of cliffs jutting across the course of the stream. As the distance lessens and the indistinguishable mass of rocks closing the vista slowly resolves itself into contours, there issue three sombre giant forms, dominating this long reach of river as the plain of Thebes is dominated by the colossi of Memnon, or the Sphinx towers over the Nile valley. Like the Sphinx and the statues of Memnon these gigantic figures look into the rising sun, but with the strik-

ing difference that these Nubian colossi rise abruptly almost at the water's edge and tower above the stream like strange and mighty water-gods. Such is the approach to the temple of Abu Simbel. The colossal statues of the Pharaohs throughout Egypt are either overthrown, or the buildings to which they belong are in ruin such that the architectural effect of colossal plastic is everywhere lost. The front of Luxor which might in some degree exhibit this effect is not yet excavated; and it is unlikely that it ever will be. Abu Simbel therefore is the only temple on the Nile where the visitor may behold such gigantic figures of the Pharaoh against the front of the temple as the architect intended they should be seen.

As we approach we perceive that the front of the temple is hewn out of the cliff. It is one hundred and nineteen feet wide and over one hundred feet high. On either side of the central door-way facing the river, two colossal portrait statues of Ramses II in a sitting posture rise far up the mountain. The tips of the crowns are seventy-five feet from the pavement. The statues are therefore larger than the colossi of Memnon. The figure on the immediate left (south) of the door has cracked obliquely at the waist and the mighty shoulders, arms, head and crown have gone crashing down into the court, leaving but three survivors along the temple front. On the bases of the thrones beside the legs of the colossi are grouped the favorite wives, the daughters and the mother of the king. Anyone who knows this face of Ramses II either from the superb Turin statue, or from his mummy, would at once recognize these colossal heads as successful portraits in spite of their vast proportions. Imagine a sculptor on the scaffolding, working upon a face so gigantic that when standing on the shoulder of the statue he could not reach the lower edge of the ear to work upon it! The expression of the faces is one of kindness and benevolence, combined with that impressive calm, and a subtle touch of oriental languor mingled with imperturbability, which in both ancient and modern

minds are associated with royalty in the East. Can we not easily understand how the Nubians worshipped not merely the great gods of Egypt besides their own, but also the living Pharaoh, as we look at these giant forms which for over three thousand years have looked out with the same mystical, impassive gaze over the swift-flowing river to greet the rising sun every morning?

When Burckhardt brought back the first modern news of this marvelous place a hundred years ago, the colossi were covered to the knees with sand. Five years later it was cleared out by Belzoni; but the creeping sands still sift over the cliff and engulf the place in a yellow tide that rises steadily and inexorably as that of the sea. It is now coming in again in a vast flood from the north side. We skirt the margin of the sand, pass the enormous fragments of the fallen monster and stand under the shadow of these tremendous giants that tower seventy-five feet above us. Happy he who does so in the hour of dawn, when the sun is just about to show himself over the desolate rocks of the eastern desert. As the east brightens there is a wonderful play of light and shadow over the forms of the sleeping giants, which, still as if not yet born from the mountain, are enveloped in the mass of the cliff. And then as the light swells they start forth, the vast limbs disengage from the weathered bulk of the dark rocks and finally in plastic strength the Titans are born before our very eyes, imbued with the radiant beauty of a desert dawn. It is then that the charm of Abu Simbel is unique as we feel the dignity and beauty, the impressiveness and mystery of the ancient world which brought forth such works as these. While the same qualities are felt in the presence of the great buildings of the lower river, it is only here that we are seized by the force of a great personality, looking down upon us from the colossi and dominating the place with a mysterious and elusive but unmistakable power.

The river cliffs are touched with purple, the magic breath of the desert fills all the place with soft enveloping

View Across Uppermost Lock and Lake above Aswan Dam. White Dahabiyeh of the University of Chicago Expedition passing through.

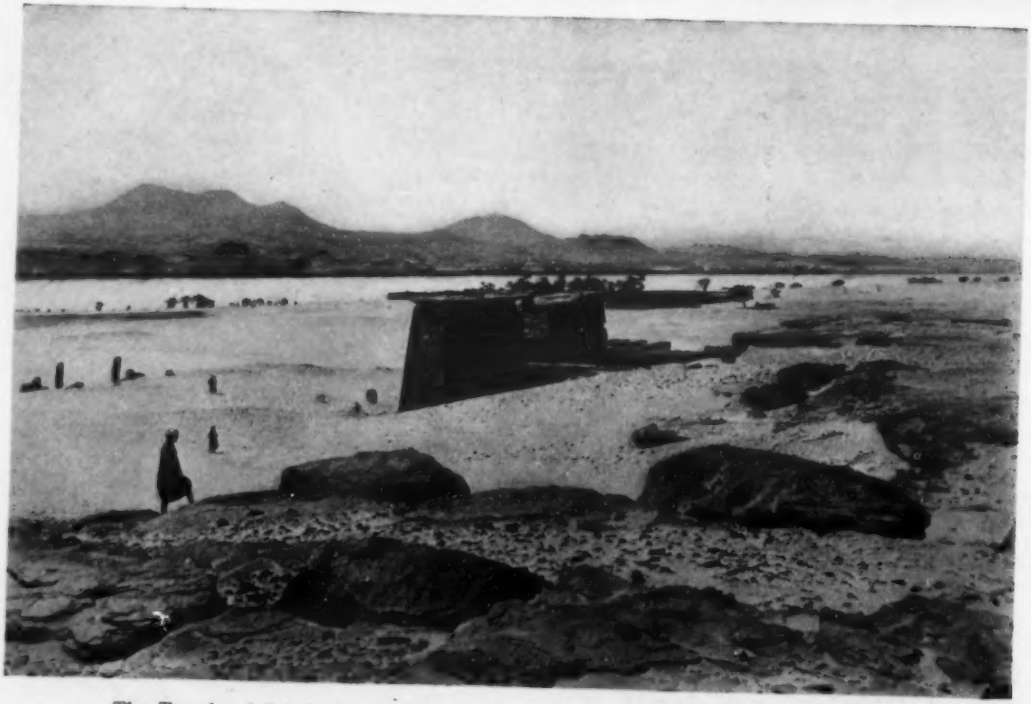
University of Chicago Dahabiyeh Moored among the Palms of the Lake above the Aswan Dam.

Village and Temple of Kalabsheh, Nubia, Forty Miles above the Aswan Dam, Showing Flooded Lower Portion of Town.

Abu Simbel Temple. Relief of Ramses II Slaying the King of the Libyans.

A Pillared Hall in the Temple of Amada, Nubia, After Excavation by the University of Chicago Expedition.

The Nile and the Desert in the Dongola Province, Upper Nubia. View from the Summit of Mount Barkal at the foot of the Fourth Cataract.



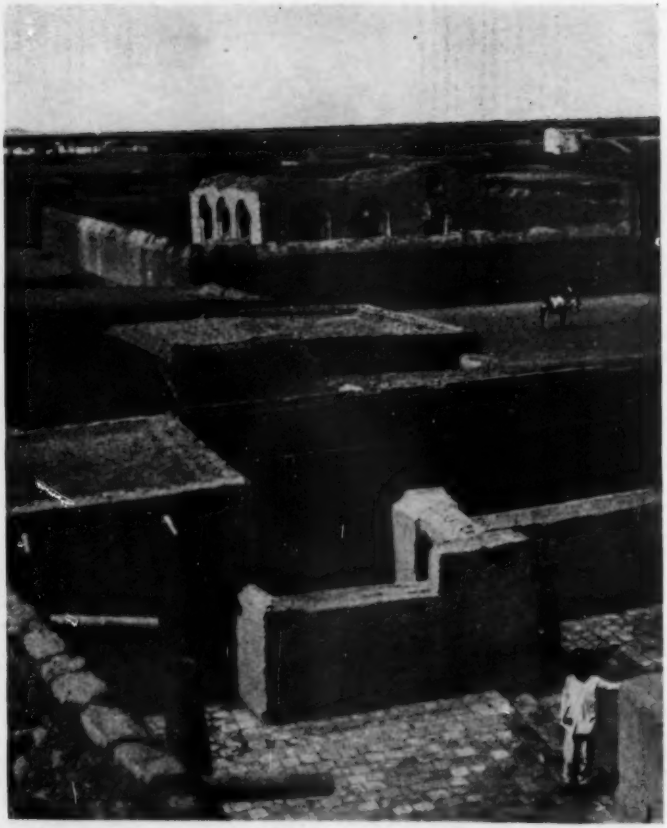
The Temple of Sebu'a, Lower Nubia, Half Buried in Sand. It has now been cleared.

Cliff Temple of Bêt el-Wali, Lower Nubia. (The arch over the door is the remains of the roof of a Christian chapel erected in the fore court.)

The Pyramid. Tombs of the Kings of Ethiopia at Meroe, Upper Nubia. The Camp of the University of Chicago Expedition at the extreme left.

Ruins of the Splendid Temple of Amenhotep III at Soleb, Upper Nubia.

Ruins of the Desert Palace of the Family of Queen Candace at Musawwarat, Nubia, in the Eastern Desert, a Day's March from the Nile.



The Tomb of the Mahdi at Omdurman. Building with Roof Blown off in Middle Distance.

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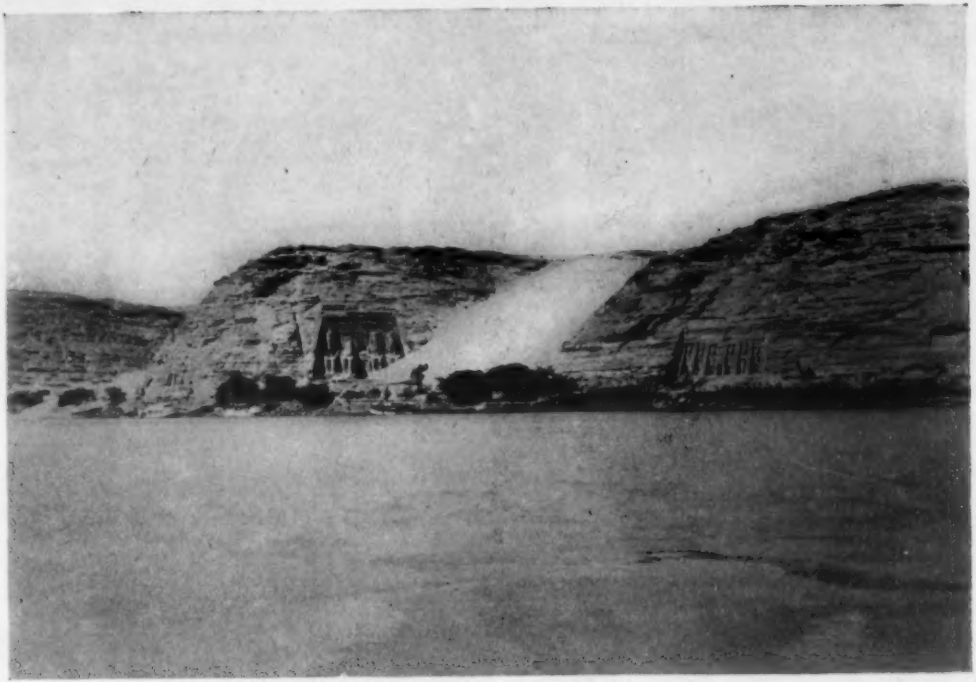
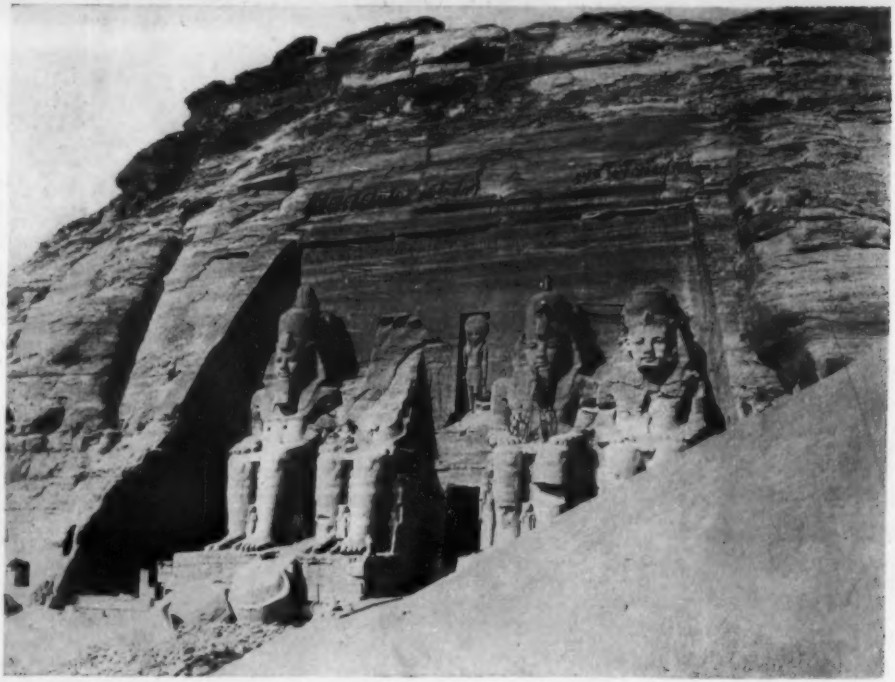
Abu Simbel Temple. Osirid Statues of Ramses II at Rear of Great Hall, Looking Down Axis to Holy of Holies.



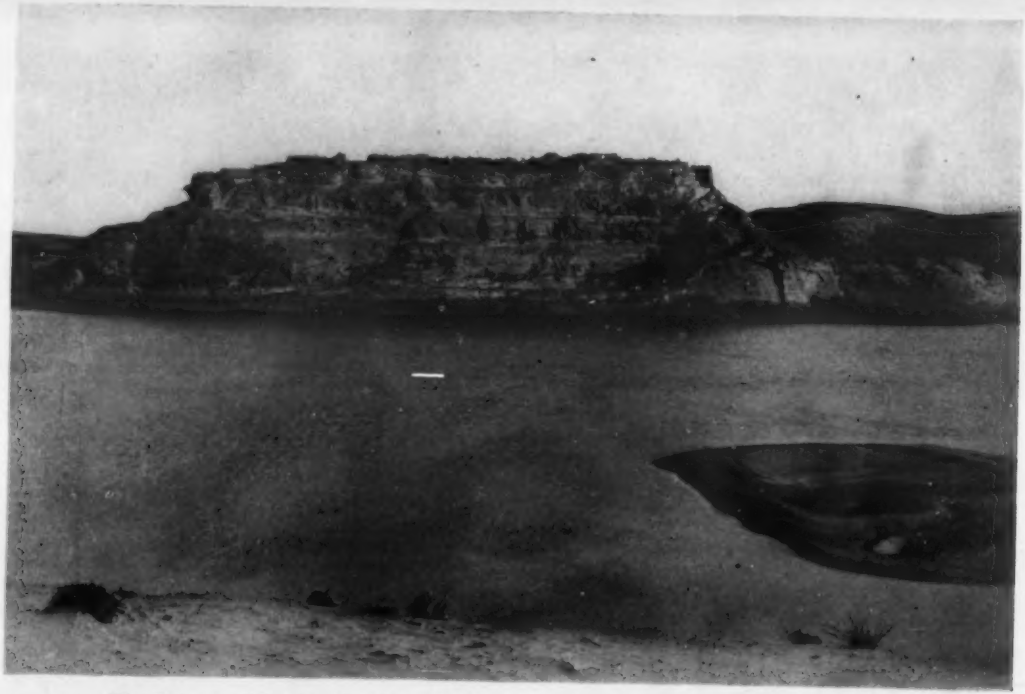
General View of the Cliff Temples and Monuments of Abu Simbel, Lower Nubia. Taken from a Sand Bar in Mid-river.



Temple of Abu Simbel, Nubia. University of Chicago Expedition at Work on the Colossi. (From the head of this figure the view of head of the left hand colossus in frontispiece was photographed.)

Looking Up the Nile from the Lofty Fortress of Kasr Ibrim, Lower Nubia. Dahabiyeh of the University of Chicago Expedition at the foot of the rocks.

Looking Up the Nile from the Lofty Fortress of Kasr Ibrim, Lower Nubia. Dahabiyeh of the University of Chicago Expedition at the foot of the rocks.



The Fortress of Kasr Ibrim, Lower Nubia. Seen from the Opposite Shore of the River.

In the Wilds of the Fourth Cataract Region. A Bivouack of the University of Chicago Expedition.

Mount Barkal, Upper Nubia, the Site of Ancient Napata, the Noph of the Old Testament, the Oldest Capital of Ethiopia, and the residence of the Ethiopian Pharaohs of Isaiah's Day.

freshness, and the universal silence is broken only by the faint weird song of the peasant at the distant shadoof, a song which wafts us only the name of Allah and fades again into the silence. Then the first keen ray bursts out of the east, flashes across the purple river, pencils sharply into prominence the inscrutable faces of the Titans, and entering the door penetrates a hundred and eighty feet into the mountain through hall after hall till it passes into the holy of holies and touches with brightness the image of the sun-god still sitting in the inner darkness of the holy place. Abu Simbel is a temple of the sun-god, and thus every morning he still enters the holy place of his sanctuary as he has done for over three thousand years. One feels that the edict of Theodosius has never interrupted the sacred functions of the place. It is still a sanctuary of the sun.

We enter the first hall. Here again Ramses dominates the place with his mighty presence. We look down the axis of the hall and eight figures of the great king thirty feet high garbed and postured as Osiris stand four on each side, each four facing the center. In the morning light they seem to stand there as if waiting for the ceremonial procession that should pass between them to the holy place. The faces are scarred and disfigured by age. Only one is still perfect, the last one on the right, and here again as with the greater figures outside, we recognize at once the eagle nose of Ramses II. We are now within the mountain out of which the entire temple was excavated, and as we follow the morning ray through the inner halls we stand at last in the silent heart of the mountain where the sun-god still penetrates every morning into his sanctuary. Here in the dim recess at the extreme rear of the sanctuary is the figure of the sun-god, together with those of Amon, Ptah and Ramses himself, all four seated in a row against the rear wall. To find Ramses here as one of the gods of the place, excites no wonder after we have felt the spell of his power outside. He and the sun are indeed lords of the place.

We wander back into the great hall to view the reliefs

before the early light withdraws. All one side of the hall behind the huge Osiris-statues of the king is occupied with an enormous series of tableaus in relief, depicting the incidents of Ramses' famous battle at Kadesh on the Orontes in Syria. It is the same series which we found at Luxor and twice on the walls of the Ramesseum. It is here more completely preserved than elsewhere, not having been exposed to the weather, and in the morning light all the familar occurrences during and leading up to the battle may be followed in detail. Incidents of his Syrian, Libyan and Nubian wars are represented on the other (opposite) wall. The lithe and virile figure of the young Pharaoh as he hurls back the Libyan king and thrusts him through with his long spear, is a splendid example of vigorous drawing. It is one of the most spirited compositions left us by Egyptian art, but is not original here, having been copied from the reliefs of Seti I at Karnak. The powerful figure of the youthful Ramses contrasts very strikingly with the nerveless limbs of the smitten Libyan, relaxing as he collapses under the fatal thrust and the resistless grasp of the Pharaoh.

A hundred yards north of the great temple is a smaller grotto temple similarly excavated from the mountain in honor of Ramses' favorite queen Nefretiri. A stately facade ninety feet wide and originally over fifty feet high is adorned with six colossal figures of Ramses and his queen thirty-three feet high, standing in niches, three on each side of the central door. An interesting chapel is cut in the rocks just south of the great temple, and the cliffs are filled with shrines and memorial inscriptions of kings and officials. There must have been a considerable town here to support these sanctuaries, but it has now disappeared and left only the temples silent and deserted overlooking the river, in solemn grandeur. Egypt furnishes the traveler many a unique and ineffaceable memory, but nowhere does the imposing grandeur of a mighty presence so impress it-

self forever upon the beholder as here before the lonely temple of Abu Simbel.

With a good wind it is possible to make the forty miles from Abu Simbel to Wadi Halfa in a single day. The long reaches of the river are slowly passed one after another, till far in the south above the wide desert a slender minaret trembles on the horizon. It is the mosque of Wadi Halfa, at the foot of the Second Cataract, the southern limit of navigation. Here the Pharaohs of the Twelfth Dynasty stopped in their absorption of Nubia, and forty miles above here, in the heart of the cataract they erected two huge fortresses to guard the southern frontier. The ruins of these strongholds still stand (see October instalment) at Kummeh and Semneh as the two places are now called although it is nearly four thousand years since they were erected. A visit to these fortresses and the country above, means a long and difficult camel-journey around the frightful rapids of the Second Cataract and through the Batan el-Hagar, or "Belly of Rocks" as the Arabs call it, for a hundred and twenty-five miles to the head of the Second Cataract country. There it would be possible by the assistance of the Sudan government, whose jurisdiction we entered fifteen miles north of Halfa, to secure a rough native boat or "gyassa" for the voyage southward through the desolate Halfa province and the difficult Kagbar Rapid of the Third Cataract into and through the beautiful Dongola Province, almost entirely around the northern loop of the great S described by the river in this region, to the foot of the Fourth Cataract, a voyage of three hundred and fifty miles. Below the Third Cataract we should pass the ruinous but still superb temple of Soleb, built by Amenhotep III in this remote region about 1400 B. C., not to mention also the little chapel to his queen Teye at Sedeinga, a few miles north; while at the foot of the Third Cataract we should find the temple of Sesebi, the oldest surviving temple of monotheism, erected by Amenhotep IV (Ikhnaton) in the fourteenth century B. C. Here in distant and inaccessible Nubia it escaped the de-

struction which overtook all the other sanctuaries of Ikhnaton in Egypt at the hands of the revengeful and infuriated priests of Amon, and has thus survived as the only temple of earliest known monotheism now in existence. At the foot of the Fourth Cataract too we should find the remains of the Nubian capital of Napata, the Old Testament Noph, against whose kings Isaiah preached (xix, 13). Here still stands the temple of Tirhaka, who strove in vain against the Assyrians whom Isaiah defied (II Kings xix. 9). These are the uppermost Pharaonic buildings upon the Nile; those of the further south, above the Fourth Cataract were erected by the Nubian kings, after their complete separation from Egypt. A hundred and forty miles of wild and unnavigable waters separate us from the navigable stretches above, and the Pharaohs never attempted the absorption of the remote regions beyond, though undoubtedly they controlled the roads leading into the Sudan for many days southward.

The six hundred miles around the northern loop of the S is an inaccessible region. A number of archaeological expeditions have penetrated into it, but only that of the University of Chicago has followed the river throughout the region, especially through the difficult and dangerous rapids of the Fourth Cataract. This northern loop of the "S" was avoided by Kitchener in his campaign against the Sudan. One of the surprising things on landing at Wadi Halfa is to hear the puffing of a locomotive, and to see a train moving out into the heart of the Nubian desert. Boarding that train you cross in a single night the desert included by the six-hundred-mile northern loop of the "S," cutting across the loop from the northern end of the "S" to its middle, that is leaving the river at Halfa and rejoining it again at Abu Hamed, at the head of the Fourth Cataract country. Thence Kitchener pushed his road to Khartum, or to the north (right) bank of the Blue Nile opposite Khartum. This railroad from the Second Cataract to Khartum is still in operation and open to traffic, and it is by its use that the

tourist may extend his visit to Khartum, though he would find it next to impossible to make the voyage of the great loop from the Second Cataract to the Fourth Cataract, in spite of the fact that the Sudan government has put in a little narrow gauge road around the Fourth Cataract from Abu Hamed to Napata (see map), which, however, now bears the modern name of Kareima. The bridge that carried the main line across the Atbara river, an eastern tributary of the Nile above the Fifth Cataract, was furnished by American mills on a rush order from Kitchener in less than forty days! This railway and British administration mean the regeneration of the Sudan, and its final rescue from barbarism. It has at last overcome the difficulties of the cataract region and made passable this oldest frontier in the world. For the first time the civilization of the North finds easy access to inner Africa, an access now rendered still more easy and effective by the new railway from the Red Sea coast at Port Sudan inland to Berber on the Nile just below the Atbara. This with the other British railroad to the equatorial lakes from the east coast at Mombasa in the far south means the winning of the Nile basin to civilization. A trip down the entire length of the Nile (cutting out the cataracts by means of Kitchener's railroad) from the equatorial lakes to the Mediterranean will by another decade be one of the commonplaces of tourist travel. Even now a party of "Cookies" may occasionally be seen wending their way "a camel-back" to the pyramids of Meroe, where the tombs of the dynasty of Queen Candace still stand. The desert journey to the remote ruins of the residences of the same dynasty, far back from the Nile at Naga and Musawwarat (see map) is a more serious undertaking, and few who are not hardened caravaneers will venture it. They are the southernmost ruins upon the Nile, unless we take account of the few heaps of mud-brick still lying at Soba, a few miles up the Blue Nile, the southernmost Christian remains on the Nile, the termination of the long line of fallen columns and other scanty remains of

long forsaken Christian churches which may still be traced through Nubia, like chips left by a receding tide as Christianity finally retreated northward before Islam. Civilization has everywhere followed river valleys, and we have journeyed in the footprints of early man as he passed up this, the most interesting valley in the Orient. We have seen his traces gradually disappear, until at this point on the Blue Nile, we stand on the verge of the great uncivilized heart of Africa from which the river issues. But if the influence of early Egypt penetrated to this frontier of the south and was then lost forever, not so in the north. When all the peoples of the Mediterranean and Euphrates world were still in the primitive darkness of the stone age, the men of the lower Nile were already developing the first great state in human history, and into that northern Mediterranean world there passed from the mouths of the Nile the influences of a refined and ever rising civilization. It bore with incessant impact upon the life of the Aegean people and its influence is traceable from century to century in the remains still surviving there, especially in Crete. Into this Aegean world then came the Greek, entering upon an inheritance which his rare genius knew full well how to improve. It is that inheritance of the Greek enriched by the contributions of his own incomparable gifts, ripened and extended by the wide and deep experience of Rome and of later Europe, but nevertheless still bearing the elements which Egypt once launched upon the Mediterranean,—it is that inheritance which has descended to us of the present day. Thus the voyage of the Nile should become for every visitor like a return to ancestral domains, a visit to the patrimony of every child of civilized lands.

IX. Roman Architecture*

By Frederick Lewis Pilcher

Professor of Art in Vassar College.

THE situation of Rome was peculiarly advantageous for its work as an organizer. Her citizens had a special aptitude for governing. It had been the part of the earlier conquerors of history to ravage and destroy. "Alexander left Chaos behind him;" the Romans, while appropriating all that they found useful and interesting among the nations whom they subjugated, extended to them the benefits of civilization and good government.

"Cæsar Left Europe"

The campaigning Latins had neither the time nor inclination to evolve a new decorative style. Then, too, Rome was adjoined by nations, the value of whose art is still evidenced by remains of great monumental and engineering interest. The southern portion of Italy, Magna Graecia and Sicily was rich in examples of the Greek columnar styles, erected by the Doric colonists who settled these districts during the eighth and seventh centuries B. C.

To the north were the Etruscans, a people of Turanian origin, who migrated, according to conjecture, from Asia in the thirteenth century B. C. The Etruscans from the remotest antiquity possessed the knowledge of the arch and

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Previous articles of this series were: I. Egyptian Architecture—Origins, September; II. Egyptian Architecture—Concluded, October; III. Chaldaean and Assyrian Architecture, November; IV. Historic Persian Architecture, December; V. The Art of the Hittites, January; VI. Phoenicia and Asia Minor, February; VII. Greek Doric Architecture, March; VIII. Greek Architecture. The Parthenon, April.

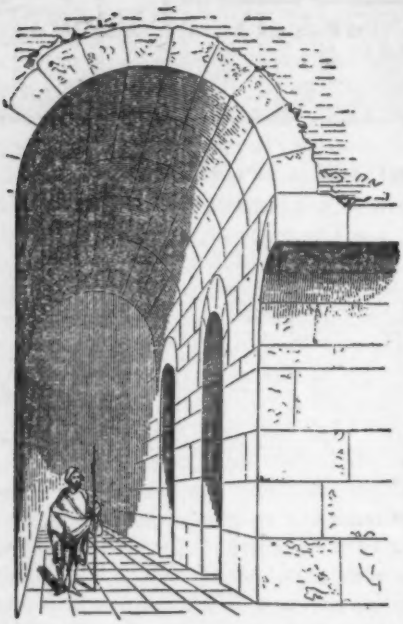
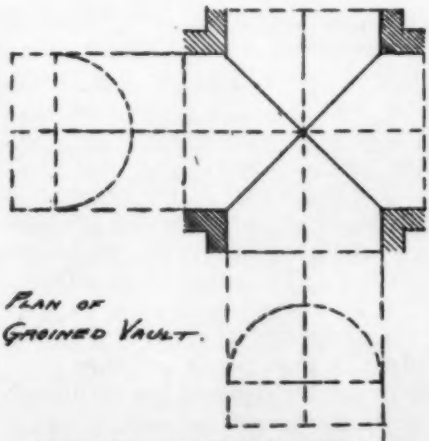


Diagram of Barrel Vault. (Fig. 12.)

simple vault construction. In their rectangular and circular temples we find the origins of the religious types of the Roman Empire.

In the history of Art, Roman architecture is of the greatest importance, because it is the fountain head out of which the style of the Early Christian, Mediæval, Renaissance and Modern eras were developed. It forms the connecting link between the practise of subsequent ages and the experimentations and perfections of the various peoples with whom the Romans came in contact. It must not be thought that Rome served as an artistic clearing house for the earlier arts and was wholly devoid of originality. It is true that many of her decorative elements were derived from Greek sources, but even in this field many innovations are found. As innovators on the structural side they contributed to the resources of the designer the *groined vault* and *dome*, derivatives of the arch which *remade* the science of planning, making possible the substitution of vast, open interiors, for the column encumbered halls of Egypt and the narrow structures of Greece, for in all of these earlier constructions the unobstructed areas were limited by the restriction of the lintel.

The Etruscans employed the arch principle in the construction of barrel vaults (a continuous arch roofing the space between parallel walls). The preservation of the Eternal City is due to a vaulted work of this kind. Under the direction of Tarquinius Superbus (500 B. C.), the tyrant of Etruscan birth, whose oppression led to the abolition of regal rule, the great Cloaca Maxima (Fig. 1.) was built. This "Great Sewer" drained the area between the Palatine and Capitoline hills and to the present day, so carefully was it constructed, it still discharges its waters into the Tiber in the vicinity of S. Giorgio in Velabro. It will be seen that the stability of a barrel vaulted fabric (Fig. 2.) depends upon the massiveness of the supporting walls and as long as the simple barrel vault was used there was no possibility of laterally developing the construction. The possibility of intersecting a barrel vault with a second one at right angles to the first, suggested itself. (Fig. 3.) The lines of intersection (Fig. 4.) or *groins* of the two vaults, normal to each other, thus had a common base upon which was concentrated the weight and thrust of both

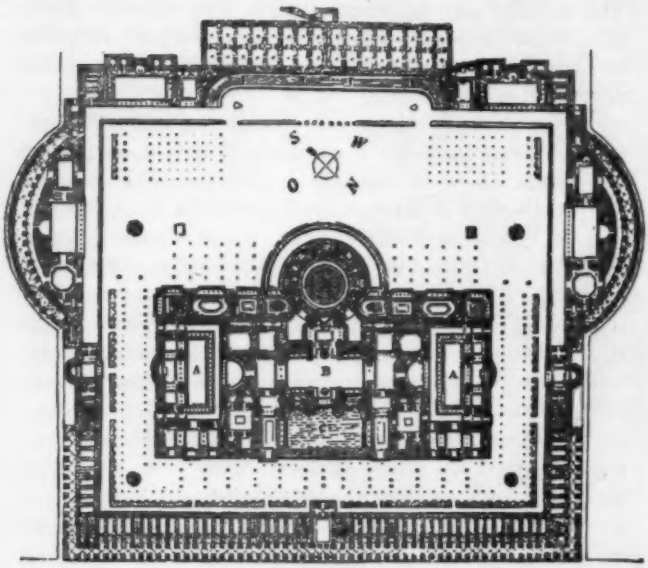


Hall of Thermae, Diocletian. (Fig. 4.)

vaults. When several bays of groined vaulting are placed together the thrusts of the arched ceiling of *quadripartite* vaults were concentrated upon a series of isolated supports or piers instead of being resisted by cumbersome walls which therefore became structurally unnecessary. The invention of groined vaulting freed the Roman plan from the restrictions of limited areas and made possible the majestic and imposing structures of imperial Rome so admirably adapted to the times. The introduction of vaulted ceilings, also freed the monuments from the possibility of destruction by fire, a menace that is ever present in wooden trussed construction. An idea of the stupendous character of this type of building can be gained by contrasting the Great Hall of the Ammon-Ra Temple at Karnak (Fig. 5.) with the tepidarium of the Baths of Diocletian (Fig. 6.), Rome. In the Egyptian edifice the broadest aisle is twenty feet wide while the uninterrupted floor space of the tepidarium of the Themae of Dioletian is 340 by 87 feet.

Having achieved a method of constructing their monuments, the Roman architects evolved a system for relating the various elements of their complicated schemes to ensure a balanced and unified plan, with carefully expressed axes and well considered vistas. (Fig. 7.) The great central halls (Fig. 6.) were lighted by huge lateral windows carried up to the full height of the vaulting, their sills being determined by the highest part of the roof of the subordinate apartments that were grouped around the important rooms. The employment of this clerestory scheme resulted in exterior effects of great variety and interest which adequately and truthfully echoed the various functions of interior distribution. The masses of the exterior were disposed with the same regard for the laws of symmetry that controlled the arrangement of the plan and universally resulted in effects of great dignity and order.

Symmetry was the dominant law of Roman composition and in its employment the designer was certain to achieve results that everyone could understand. Horizontal



Ground Plan of Baths of Caracalla, Rome. AA. Entrance Halls; B. Central Vaulted Hall; C. Unroofed Bathing Pool; D. Domed Hall with Hot Bath. (Note general symmetry.) (Fig. 7.)

dual symmetry (bilateral symmetry) has an esthetic value in that it accords with the normal habits of vision developed by the environment, and designs laid out in deference to its laws make an immediate appeal to all people. To the more highly cultivated esthetic sense, proportion is more pleasing than symmetry because it is susceptible of more complex treatment. To the Roman, with his ideas of formal classification and organization, simple symmetry was the best method of portraying his racial characteristic.

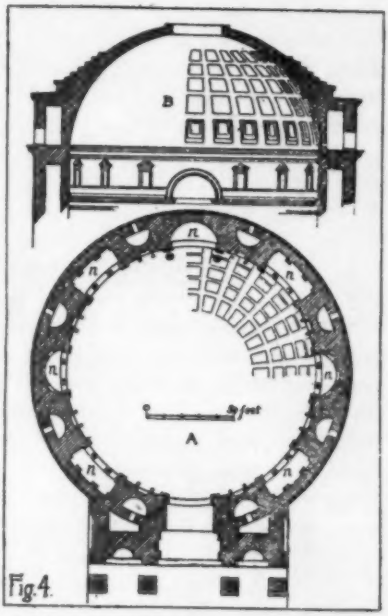
A unified whole, made up of like and equally distributed parts may be taken as the canon of Roman architectural composition. It was essential that the works of the Roman architect should command attention through the qualities of colossal size, opulence of materials, and visible grandeur.

The delicacy and refinement that so well reflected the intellectual atmosphere of Attica would have been ineffective in expressing the overwhelming power and administrative formalism of the Empire.

Architecturally, the most important vaulted building of Rome was the Pantheon (Fig. 8.), built by Hadrian between 117-138 A. D. It consists of an hemispherical dome 142 feet in diameter supported upon a massive circular drum. A great *oculus* or round opening, twenty-eight feet in diameter at the top of the dome admits light into the temple and at the same time reduces the weight of the structure at its weakest point. (Fig. 9.) This aperture is open to the sky, but so great is its height (148 feet) that the most violent storms have but little effect upon the temperature of the interior. In bright weather the sun's rays dart through the opening and mark a great circle of light upon the pavement; in storm the rain falls slowly in the form of a humid cylinder. Architect and painter alike have felt the impressiveness of this great interior. When Michael Angelo painted the vault of the Sistine Chapel he placed his titanic figures against a background inspired by the sky vista that he so loved to look up toward in the Pantheon; later in his design of St. Peter's he stated that his aim was to raise the dome of the Pantheon upon a substructure of the form of the basilica of Constantine. A study of this same monument inspired in the Florentine architect, Brunelleschi, the idea which he executed in the construction of the dome of S. M. del Fiore of Florence.

The thick supporting wall (Fig. 10.) of the monument is pierced by eight, alternately rectangular and circular niches, one of which forms the entrance to the building. The hemispherical surface of the interior of the dome was treated with 140 coffers. The lower mouldings of these coffers are made wider than the upper ones in order to overcome the effects of foreshortening. Concerning the fabrication of these panels there has been a great amount of interesting discussion. Professor Hamlin has proposed

what seems to be the only solution of the problem that answers all objections. This is "that the paneling was more or less of an afterthought, in conception, if not in time, planned as a decorative embellishment of a dome originally intended to present a smooth surface internally, and that it was *hewn in the solid brick work* after the completion of the vault."



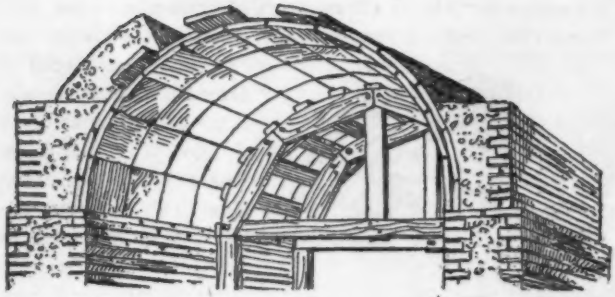
Section and Plan of Panthon from Drawing by Prof. Hamlin. (Fig. 10.)

The exterior of the edifice is not in its present state imposing. The brick facing was designed originally to be covered with marble. A monumental Corinthian porch, evidently constructed of materials and on the plan of the prostyle to the older temple of Agrippa, that stood on this site, is an incongruous element in the design. Yet due to the grandeur of conception and remarkable construction and notwithstanding its decorative deficiencies, the Pantheon must be ranked with the Parthenon at Athens and the Church of Hagia Sophia at Constantinople as one of the masterpieces of the world's architecture.

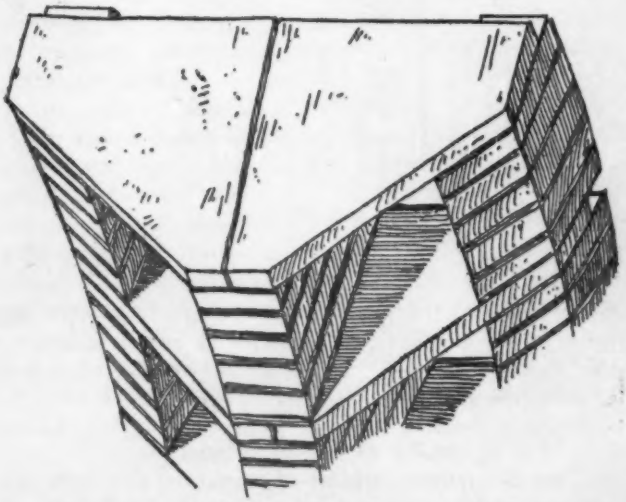
Construction.

With the Romans the building of a great monument comprised two distinct operations, first the fabrication of the ossature or core of the edifice, and secondly the envelope or decoration which was as independent of the con-

struction as clothing is independent of the man. It would have been entirely at variance with the economic and utilitarian ideas of the Romans to consider in the rearing of their huge buildings the employment of cut stone, as their constructive element after the fashion of the Egyptians and Greeks. Such a material would have not only entailed enormous expense and skilled labor, but the erection of a single structure such as the Pantheon or the Thermae of Caracalla or Diocletian, would have stretched over a lifetime. The necessity for rapid building and the availability of numerous unskilled laborers drawn from the population of slaves and soldiers rendered essential the development of a new constructive process. The solution of the problem was found in the use of concrete, not only for the walls, but also for the vaults and domes of their innumerable architectural undertakings. Great quantities of lime and cement rock are found in Italy so that concrete of a fine grade was possible with a minimum of labor and cost. In the vicinity of Rome *pozzolana,* a volcanic product, was abundant and produced an unequaled hydraulic cement. Let us follow the method of erecting an Imperial structure. First skilled engineers would carefully plot out the lines of the foundations and walls and test the bearing power of the ground upon which the great vault supports were to stand. Hundreds of unskilled workmen excavated for the foundations and the ingredients for the concrete. Chosen artisans laid up rough brick wall faces; the space between them was filled with the concrete as fast as the faces were carried up. Thus in a short time the supporting walls would be raised to the height where the vaults were to commence. Temporary centers, or forms of wood, were then erected upon which the laborers moulded the vaults. At times, in order to obviate the labor and expense of an enormous timber centering, a light slat center was used upon which a vault of thin tiles set in hydraulic cement was laid. (Fig. 11.) Upon this shell the concrete was heaped to the required thickness, rarely less than six feet over the thinest part. In the con-

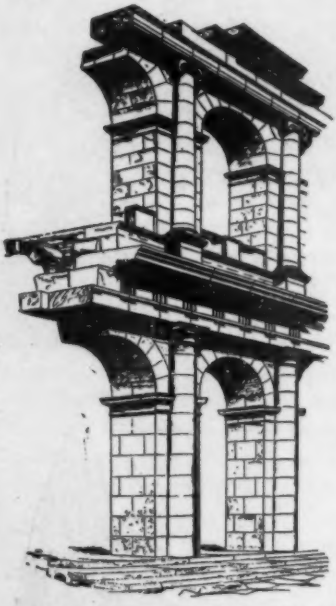


Roman Vault showing Tile Construction and Wooden Center. From a Drawing by Professor Hamlin. (Fig. 11.)



Brick Arch Ribs connected through Tiles. Drawing by Professor Hamlin. (Fig. 12.)

struction of great domes and vaults of very great width it was necessary to build a framework of brick ribs. (Fig. 12.) These ribs were supported during erection by wooden centers and were united at frequent intervals by large tiles making a skeleton of cellular form. These cells were then filled with concrete and the whole shell covered with the same material. A vault or dome constructed as described formed a homogeneous mass, exerting no side or diagonal thrusts, but rested upon the supporting walls and piers like a huge hollowed lintel.

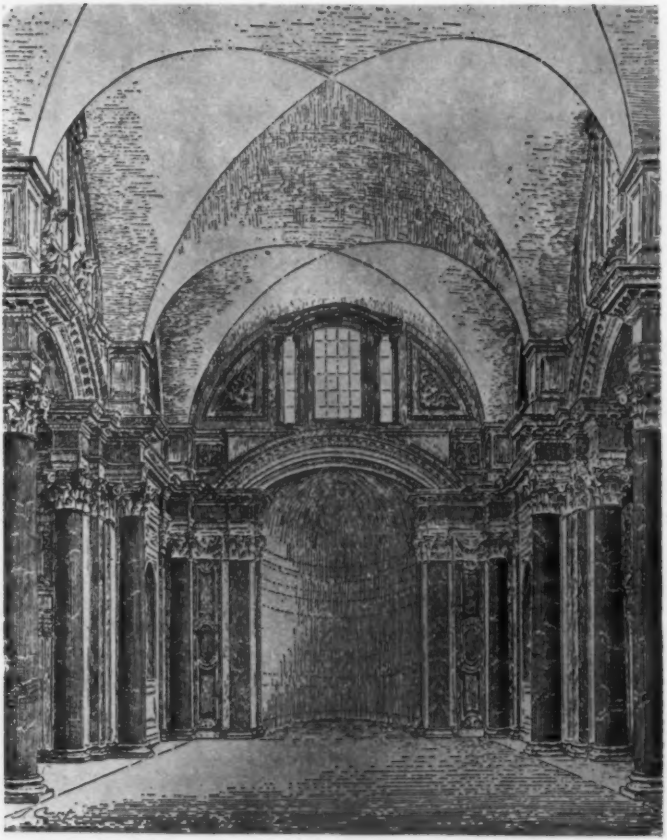


Theater of Marcellus, Rome. (Fig. 13.)

When the core of the monument was thus completed the task of decorating it was undertaken. Artists and precious materials were commandered without regard to cost. The vaulted ceilings were embellished with moulded stucco, lavishly painted and gilded and the rough walls were enriched with marble veneering, columns and entablatures. Carvings of a decorative nature, and a profusion of statues added to the general architectural opulence of the whole.

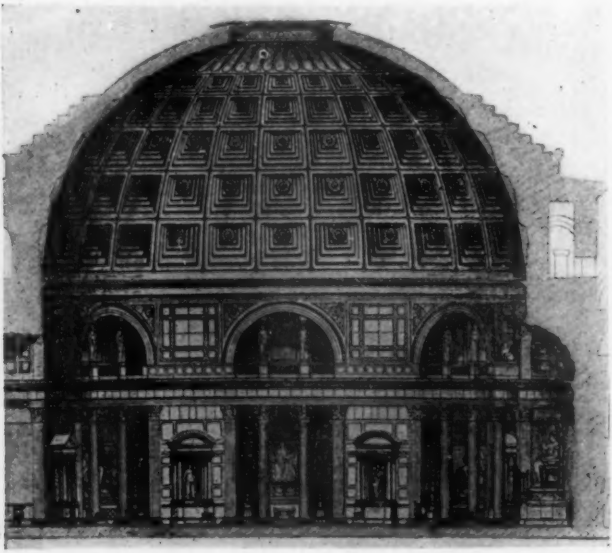
The Roman Arcade. (Fig. 13.)

The decorative procedure of enveloping their arcuated masonry masses with columns, entablatures and their accompanying accessories confronted the Roman architects with the problems of harmonizing in the same design the

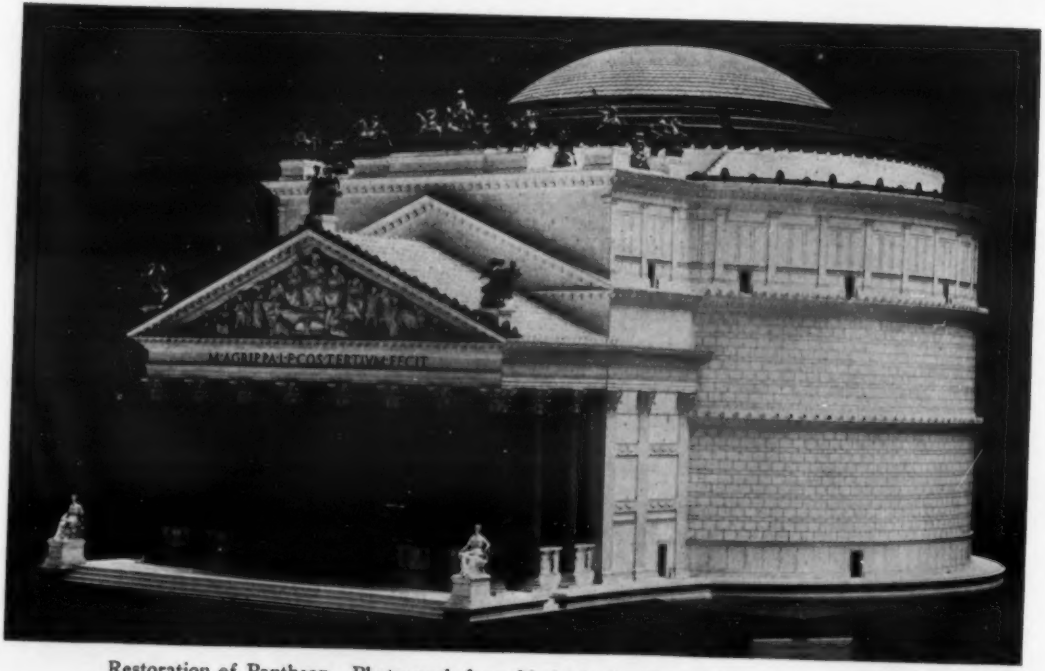


Groined Hall of the Thermae of Diocletian. (From "A Dictionary of Architecture and Building.") (Fig. 3.)

Cloaca Maxima (Barrel Vault), Rome. (Fig. 7.)

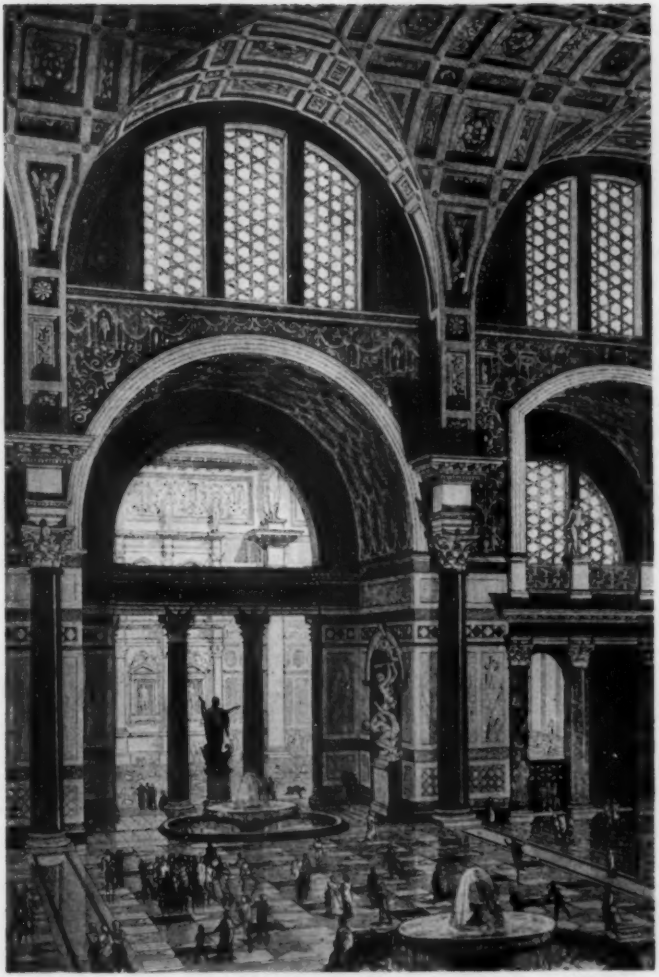


Section of the Pantheon (Restored). (Fig. 9.)



Restoration of Pantheon. Photograph from Model in the Metropolitan Museum. (Fig. 8.)

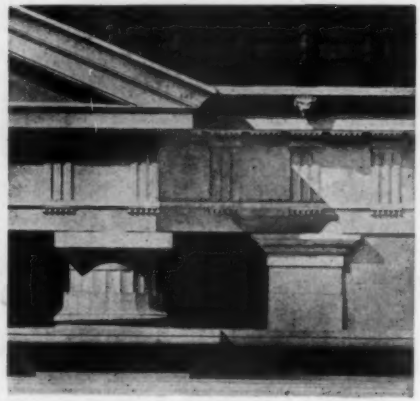
Hypostyle Hall. Temple of Amon-Ra, Karnak. From Model in Metropolitan Museum. Compare with cut on opposite page. (Fig. 5.)



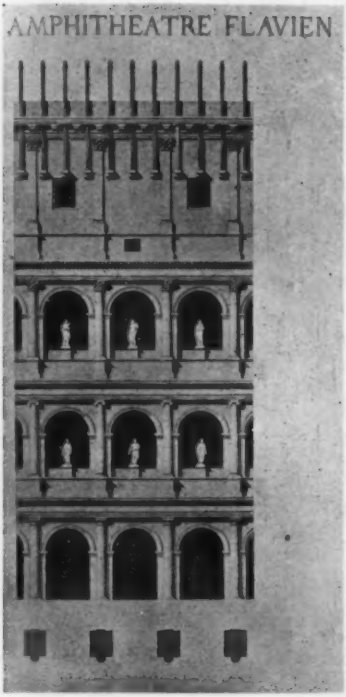
Restoration of Tepidarium, Baths of Caracalla. Hypostyle Hall.
Compare with cut opposite. (Fig. 6.)

Details, Forum of Trajan. Roman Ionic Capital. (Fig. 17.)

Capital and Base of Column, Temple of Concord, Rome. Corinthian Order,) (Fig. 20.)



The Roman Doric Order. (Fig. 16.)

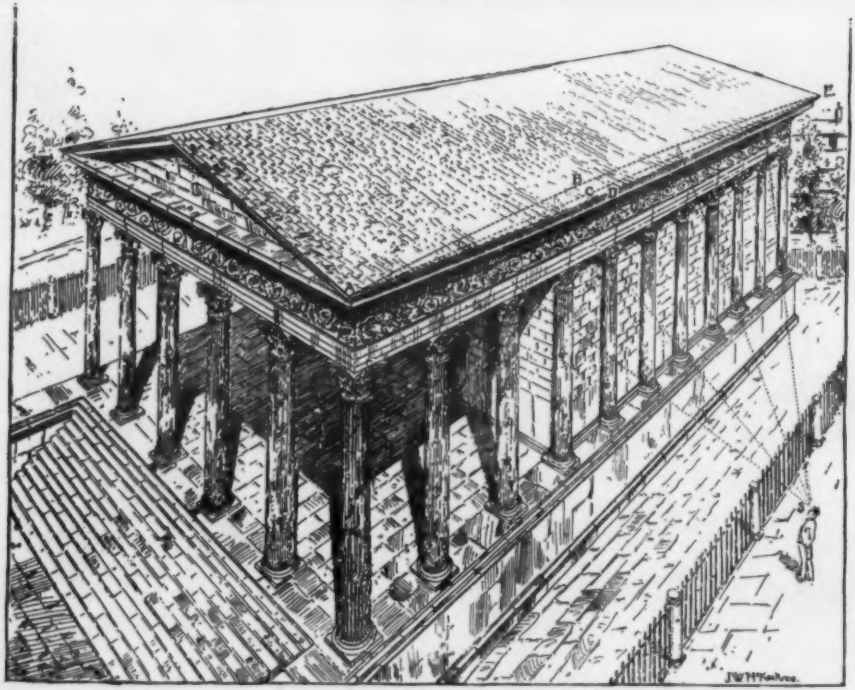


The Orders of the Colosseum. (Fig. 14.)

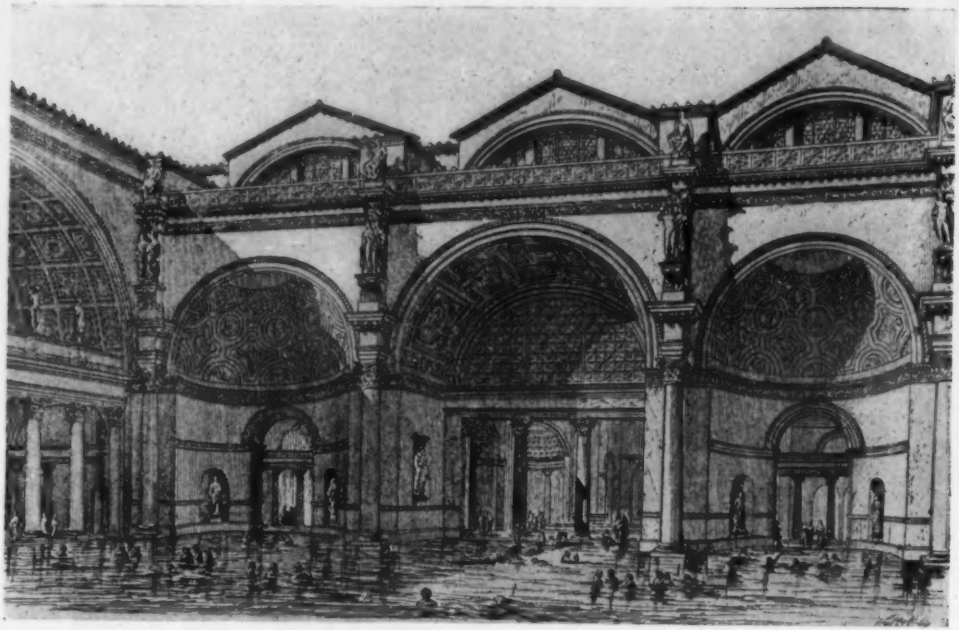
Temple of Fortuna Virilis, Rome. (Fig. 18.)

The Maison-Carrée, Nimes, France. (Fig. 22.)

The Maison-Carrée, Nimes, France. (Fig. 22.)

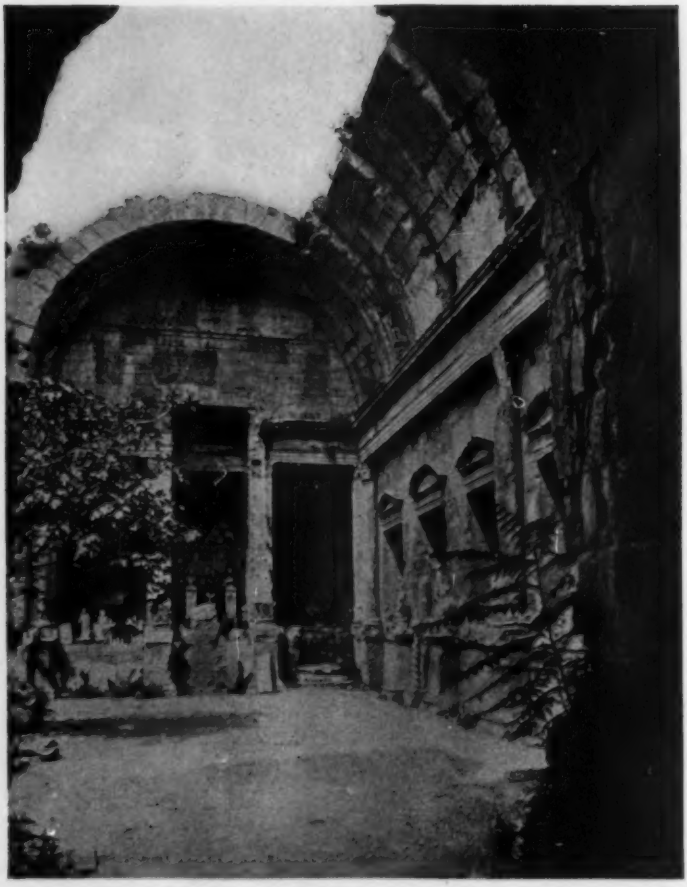


Bird's-eye View of the Maison Carrée, showing the Optical Effect of the Cornice Curve. From the Smithsonian Report of 1894, "A Discovery of Greek Horizontal Curves in the Maison Carrée at Nimes." By W. H. Goodyear. (Fig. 23.)



The Cold Plunge, Baths of Caracalla. (Fig. 28.)

The Colosseum, Rome. (See Fig. 14.)



Temple of Diana, Nimes.

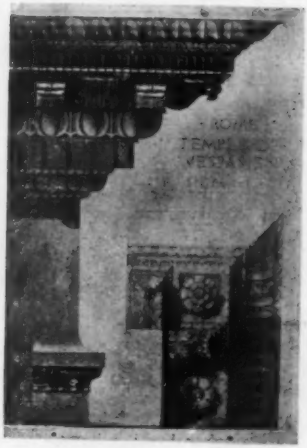
Ruins of the Baths of Caracalla.

Capital and Base of Pilaster, Portico of Octavius, Rome.

Capital of Column. Pompeii. Corinthian Order.

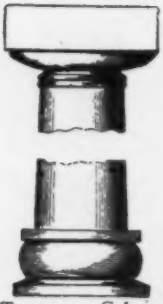
Temple of Vesta, Rome.

Details, Temple of Vesta, Rome.

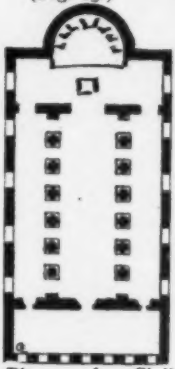


Entablature, Temple of Vespasian, Rome.

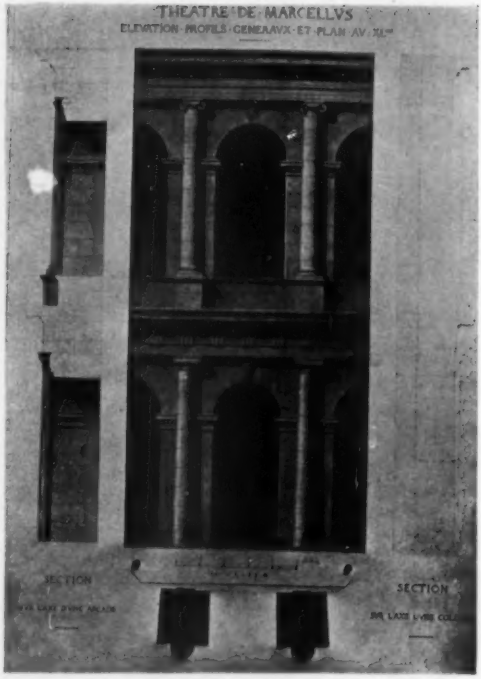
Entablature, Portico of Pantheon, Rome.



Tuscan Column from Vulci. (Fig. 15.)



Plan of Civil Basilica. (Fig. 25.)



From the Theater of Marcellus. (See Fig. 13.)

conflicting forms of the lintel and the arch. In the older arts, where the two constructive principles were used together, the arch had been placed above the lintel to relieve that weaker member from the weight of the superimposed mass (c.f. description and diagram of the entrance to the Pyramid of Cheops in the September CHAUTAUQUAN, 1909). In the Imperial system the orders were introduced merely as ornamental features without constructive functions and the salient horizontal lines of the entablatures were designed to mark the division of stories or the place of springing of the great ceiling vaults. The arches that marked on the exterior the form of the vaults that supported the stories or gave entrance to subordinate chambers of lower height than the major vaulted or domed halls necessarily occurred *below* the entablature line. (Fig. 6.) The columnar forms, engaged to the masonry mass between the arches were introduced to give apparent support to the entablature. This arrangement inverted the position of the lintel and arch as hitherto used, placing the weaker member above the stronger, and has been criticised as a reprehensible departure from structural propriety. The contention is not valid, however, for two obvious reasons; first, the engaged columns necessitated an overhanging entablature, whose projection beyond the face of the arch masonry indicated very clearly its introduction as an applied and not a structural feature, and secondly, through the contrast of the straight lines of the "order" with the curves of the arches a pleasing variety was obtained the popular value of which has been attested by the adoption and use of the Roman Arcade scheme in all subsequent styles even to our day. The columnar forms, as placed by the Romans, fulfilled, too, an esthetic function in that they emphasized the constructional divisions and elements of the building and gave to the monuments a sparkle and play of light and shade that added greatly to their appearance. (Fig. 14.)

Superimposition of the Orders.

When the Roman system of decorative mural architecture was applied to edifices of several stories, like the Colosseum (Fig. 14.) or the Theater of Marcellus (Fig. 13.), the "orders" were superimposed; the simplest, the Tuscan or Doric, was engaged to the ground story piers, the Ionic to the second story and to the third the most ornate, the Corinthian. In such a superposition all of the elements of the several orders were mutually related in terms of a common modulus.

The Roman Orders.

The Romans employed five columnar orders,—The Tuscan, Doric, Ionic, Corinthian and Composite. The Tuscan (Fig. 15.) was adopted from Etruria and appears infrequently, differing from the Doric in detail only, lacking triglyphs, dentils and mutules. The Doric (Fig. 16.) was a mechanization of the Greek form, in which all of the wonderful subtleties of the Hellenic master work were replaced, by details that could be more easily and rapidly executed by ordinary stone carvers. The triglyphs were equally spaced and in most cases one is centered over each column, resulting in the employment of a part metope at the terminals of the frieze, a feature that detracts greatly from the apparent strength of the angles of the entablature. The column was eight diameters in height and was frequently unfluted. Differing from the Greek type the shaft was given a simple base consisting of a square plinth and rounded mouldings. The capital was greatly simplified. The echinus was profiled in a simple curve; the annulets of the Greek Doric were replaced with flat fillets or half rounds; the scamillus disappears and an astragal, consisting of a projecting moulding separated the necking of the capital from the shaft. The employment of the Tuscan and Doric orders was restricted to buildings of severe utility or to the first story of a superposed design.

The Ionic style (Fig. 17.) never was popular with the Romans and when employed followed the general propor-

tions of the Greek order. It underwent modifications in the minor mouldings and particularly in the capital. The volutes were greatly simplified and the cushion line, that in the Hellenic type assumes a graceful falling curve above the echinus, was straightened. This horizontal cushion line may be taken, by the student, as a means of distinguishing the Roman style from the Greek. The troublesome problem of treating the helix capital at the corner of a building was solved in more or less unsatisfactory manner by repeating the spirals upon all four sides of the capital and omitting the balusters. The volutes projected at an angle of forty-five degrees, producing an effect of artistic weakness, an arrangement wholly at variance with the true meaning of the form. The column was nine diameters in height; the shaft was carved with twenty-four deep flutings separated by narrow fillets. The style is exemplified in the Temple of Fortuna Virilis (Fig. 18.) and the Temple of Saturn. While the foregoing orders were used in a more or less perfunctory fashion, such was not the case with the Corinthian which the Romans made peculiarly their own and which from the time of Sulla became the favorite and characteristic Roman Order. The Corinthian capital (Fig. 19.) lent itself admirably to elaborate decorative treatment and obviated all the difficulties of corner treatment so fatal to the Ionic. Then, too, the graceful flare of the bell carried the eye easily from the verticals of the fluted shaft to the entablature, so that the feeling of strong support was not lost through the multiplication of the ornament, for no matter how profuse was the application of leaves, tendrils and small spirals to the capital, the curving form of the structural core of the capital was always

Corinthian Capital. Mars Altar, Rome. (Fig. 19.)

apparent. Thus to the Roman the requirements of strength and ostentatious opulent decoration were adequately and satisfactory met in the columnar device. "Nothing could have been better fitted than this order to express the magnificence and luxury of the Empire. All the other orders contributed to make it sumptuous, and when its various features and proportions had been finally formulated, according to the Roman manner, it represented the very highest and most characteristic expression of Roman art. It appeared, not only in the most splendid monuments of the capital, but lavishly reproduced in the remotest provinces in great religious and civic buildings, it fascinated the barbarians and confirmed the rule of the conqueror." The entablature (Fig. 20.) of the order is an amplification of the Ionic. The Corona was given a greater projection and to lend support to this extended feature elaborately carved brackets or *modillions* were developed. The foliated embellishment of these new elements and the extravagant ornamental detail applied to the minor mouldings of the cornice and architrave harmonized well with the rich capital. Fragments from the Temples of Mars Ultor, Castor and Pollux, Concord and Vespasian, should be studied to appreciate the possibilities of the Corinthian style. The fifth order, the Composite, was a debasement of the Corinthian. Its characteristic feature, the capital, was a combination of the Ionic and Corinthian in which all of the undesirable features of the former and few of the admirable qualities of the latter were reproduced. It never achieved the distinction of a formulated order and may be described as the Corinthian gone to seed. The most interesting illustration of the type is from the baths of Caracalla.

Roman Monuments.

The Romans being an essentially commercial people and their chief interest directed to the extension of their power, religious observance and its accompanying architecture was relegated to a subordinate place. Great halls for the transaction of business and the dispensing of justice assumed a

far more important position. Luxury and the desire upon the part of the rulers to popularize their regimes necessitated the erection of fora, amphitheaters, baths, palaces, triumphal arches and a host of utilitarian constructions, such as aqueducts, roads, bridges, etc.

Temples.

The temples were of two types, rectangular and circular. The plans of both classes were of Etruscan origin. The rectangular shrine comprised a deep porch leading to a cella in which the statue of the deity was placed. The demands of splendor caused the temple of the Imperial City to be planned with more regard to size and ornamentation than to refinement. In the colonies, however, where the taste of the native artists was allowed to influence the design results were produced far superior in artistic quality to the more colossal fanes of the capital. The so-called Maison Carrée at Nimes (Fig. 22.) (Southern France) is perhaps the best example of this class. Greek colonists had settled the region and all of the structures erected, during the Roman supremacy in the region were stamped with the hall mark of Hellenic art. The building stands upon a high *podium* or base ascended by a monumental stairway from the west. The porch, characteristically deep, is hexastyle. There are eleven columns on the sides, three of which belong to the porch; the remaining eight are engaged to the walls of the cella, producing a pseudo peripteral form. Not only is the Masion Carrée remarkable for the beauty of its proportions and the elegance of its detail, but it is in addition one of the most interesting buildings of Roman architecture in that the curvilinear refinements were introduced in its construction. These curves were not, curiously enough, applied, as in the Attic monuments to all parts of the edifice, including the pediments, but were *restricted to the sides.* (Fig. 23.) These notable observations were made in 1891 by Professor W. R. Goodyear. His deduction was, that Nimes being settled by a Colony of Alexandrian Greeks, the curvilinear sys-

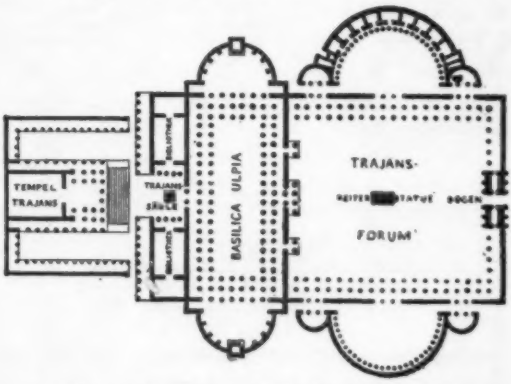
tem here used was derived from Egypt, where, as has been described in the description of Egyptian architecture (CHAUTAUQUAN, October, 1909,) the curves were constructed in horizontal planes. In Greece as we have seen (CHAUTAUQUAN, April, 1910,) the deviations were made convex in a vertical plane, a more refined expedient for attaining the same result as that aimed at by the Pharaonic architects.

The circular temple plan achieved its most monumental results in Rome itself, although throughout the Latin world many minor monuments of this class were built. At first the round temples, as the two so-called temples of Vesta, one at the foot of the Palatine and the other near the Cloaca Maxima, were surrounded with Corinthian peristyles and covered with a timber trussed roof. With the development of vaulting it was possible to greatly enlarge this type of structure until finally the impoosing rotunda of the Pantheon was produced.

Fora.

Originally the *forum* of a Roman city was the market place and official center of the public life akin to the *agora* of a Greek town. In ancient Rome, after the hostile tribes had been combined into a single state, the marshy valley between the Capitoline and Palatine hills was drained by the Cloaca Maxima, and reserved for the meeting of popular assemblies and the transaction of civic and judicial business. It was officially known as the Forum Romanum. In earliest times the sides of this area were lined with Tabernae or shops, in which tradesmen of divers crafts plied their callings. In the course of time the shops gave way to public buildings—basilicas, temples and their accessories. With the growth of the empire the space of the Forum Romanum was felt to be too confined for the administrative center of the state and to relieve the congestion, a series of rectangular courts, separated from each other by high walls and internally surrounded by colonnades were provided adjoining the Forum. Between the time of Caesar and Trajan five fora were constructed, each containing temples, basilicas, triumphal arches

and other public edifices, connecting the center of the Ancient City with the monumental area of the Campus Martius to the north. The architectural embellishment of the Fora of the Emperors was executed in a most magnificent manner and reached a climax of structural splendor in the Forum of Trajan (Fig. 24.), which was looked upon as

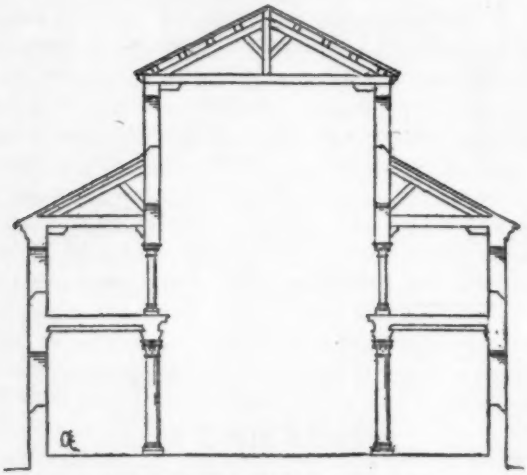


Plan of the Forum of Trajan. (Fig. 24.)

one of the chief glories of the Eternal City. This remarkable work, designed by Apollodorus of Damascus, consisted of four parts, the general assembly space or Forum proper, the Basilica Ulpia, the Greek and Latin libraries with the noble votive column of the Emperor in their common court and the temple. Ammianus (16.10) thus describes it as it appeared in 356 A. D.: "But when he (the Emperor Constantius) reached the Forum of Trajan, a work which we suppose is entirely unique and which even the gods cannot help admiring, he stood still as if thunderstruck, permitting his eyes to wander over the gigantic edifices, the description of which transcends the powers of speech, and the like of which can never again be attempted by mortals."

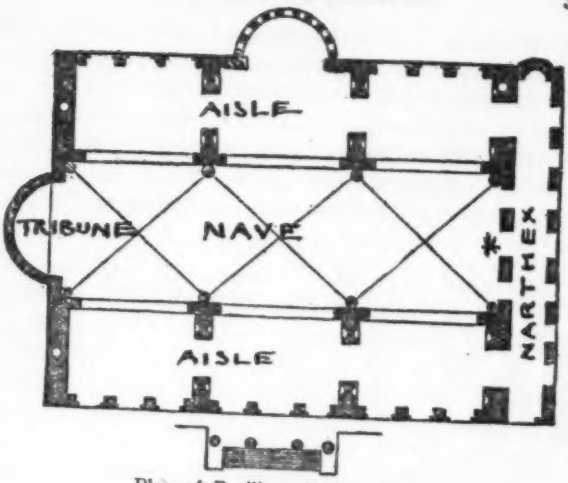
Basilicas.

The Roman basilica was a form adapted from the Greek royal house for the transaction of judicial and com-

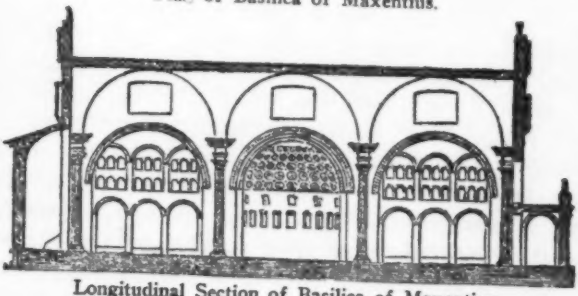


Section of Civil Basilica. (Fig. 26.)

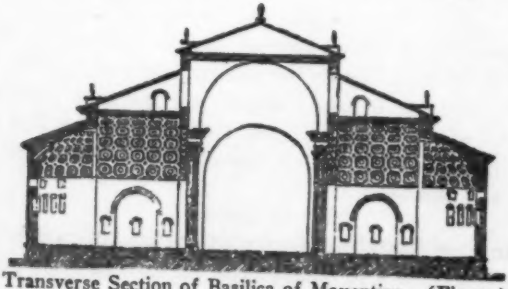
mercial business. (Fig. 25.) Such buildings appear to have been introduced about the beginning of the second century before Christ. Oblong in shape, they consisted of a broad and lofty central nave separated from single or double side aisles by colonnades. The roof of the nave was carried above the level of that of the side aisle forming a clerestory, which was pierced with windows. (Fig. 26.) At the end of the nave furthest from the entrance was a raised tribune, where seats were arranged for the praetor, and his assessors. Before the tribune stood an altar upon which libations were poured before and at the close of the transaction or public ceremony. To the time of Constantine these structures were covered with wooden roofs and it was that emperor who completed the edifice commenced by Maxentius who first endowed the basilica with a vaulted, fireproof covering. The most important of the timber covered basilicas were the Sempronian and the Aemilian (54 B. C.) according to Professor Hamlin, the great Julian (51 B. C.) in the Roman Forum and the mag-



Plan of Basilica of Maxentius.



Longitudinal Section of Basilica of Maxentius.



Transverse Section of Basilica of Maxentius. (Fig 27.)

nificent Ulpian (113 A. D.) in the Forum of Trajan had roofs over the aisles only, the nave being left open. The vaulted basilica of Constantine (Fig. 27.) in its nave reproduced the scheme of the tepidarium halls of the imperial thermae. This building is of especial importance because of the controlling influence that it exerted upon the later architectural style of Byzantium and Medieval Europe.

Thermae.

The great thermae establishments of Rome were not merely bathing halls, but were rather great civic clubs in which every possible provision was made for the entertainment and comfort of the citizen. They characterize well the Roman spirit at an advanced period of her history and present the fullest development of the essential points of originality of the architecture of the emperors. The most extravagant and sumptuous of the Thermae was that begun by Caracalla (Fig. 7.) in 212 A. D. It could accommodate one thousand bathers at one time. The bath proper comprised a hall for the hot air bath of moderate temperature, the *Tepidarium* (Fig. 6.), secondly a hot water plunge, the *Caldarium* and finally an hypaethral hall containing a cold swimming tank, the *Frigidarium*. (Fig. 28.). Dependent rooms provided for the operations of rubbing, annointing, strigil cleaning and massaging. In addition there were numerous other chambers, the exact uses of which are unknown, but are supposed to have been planned for private bath rooms, gymnasiums, libraries and lecture halls. The enclosure was arranged as a great park and adorned with flower gardens, exedrae, statues and fountains. A stadium for racing and complete equipments for all sorts of outdoor games and recreations were furnished. In addition to that of Caracalla, establishments of this kind were erected with the same disregard to cost by Agrippa, Titus, and Diocletian.

The Colosseum.

Another distinctive Roman edifice was the amphitheater, an oval structure planned for the exhibition of gladia-

torial combat and bloody scenes of strife. The emperors looking always for some way to popularize themselves with the people found no other gift so acceptable as these gigantic open air places fitted to pander to their inhuman desire for witnessing contests in which suffering and death were essential elements. Accordingly buildings of this kind were scattered throughout the Roman world. Pompeii, Pola, Nimes, Verona, Constantine and many other cities were endowed with them, but the most gigantic and architecturally imposing of the series was the Colosseum completed in Rome by Titus (80 A. D.). This stupendous structure was nearly a third of a mile in circumference and one hundred and fifty-six feet in height. The interior had seats for eighty-seven thousand spectators. The exterior façade was divided into four stories, the lower three of which were decorated with engaged columns of the Tuscan, Ionic and Corinthian Orders, and the fourth was relieved by the application of Corinthian pilasters. While but a portion of the original fabric remains, the ruin is profoundly impressive and the student can appreciate the overwhelming effect it must have had upon the war-loving Roman and how for the people of the dark ages it stood as a symbol of the past greatness of Rome.

"While stands the Colosseum, Rome shall stand,
When falls the Colosseum, Rome shall fall,
And when Rome falls, with it shall fall the World."

It would be impossible, within the limits of our space to enter into discussion or description of the myriad utilitarian works of the Empire. While expressing truthfully the character of the age, the Triumphal Arches, Aqueducts, Votive Monuments, Tombs, Theaters, Villas and the Palaces before Diocletian, do not illustrate any new significant phase of architectural form. Each of the constructions treated presents an architectural innovation, structural or decorative, which was continued by subsequent civilization and lives today, as elemental in our modern design. The

barrel vault of the Cloaca is reproduced in principle, in arcades, and tunnel construction, and the *groin vaulted* scheme that grew out of the simple vault has in a developed form made possible our great cathedrals. The continuance of the fundamental law of Roman composition, *bilateral symmetry,* is apparent in the inspection of the façades of our great public buildings. The Dome of the Capitol at Washington is a direct descendant of the Pantheon Cupola. It is true that it depends for its construction upon a steel skeleton and is supported above the square hall by pendentives, an innovation of Byzantine art, but the profile of the soaring dome and its circular encolumned drum below is the final expression in the architecture of today of the greatest of all Roman monuments. The Metropolitan Museum in New York possesses a most interesting reconstruction of the Pantheon. It is of such a size and so placed that the student is able to stand within the structure and by the exercise of a little imagination, visualize in the third dimension the splendors and wonderful effect of the Hadrian production. Our illustration reproduces a photograph of this model. (Fig 6.) The Roman method of concrete construction in many of its details may be seen in actual operation in the erection of our fireproof buildings, sewers or subterranean projects and the decoration of the core or ossature is duplicated in practically every building operation that the reader will inspect. The Roman Arcade is so frequently employed that no further specification of its use is needed. Regarding the orders, perhaps because there is a certain similarity between the conditions that govern our own and the Roman arts, the several column forms with their various details are popular in the same order as among the Romans. The Corinthian, more or less modified, according to the taste of the designer, has been greatly demanded in monumental work, although the Ionic has been introduced in a number of cases with signal success. The Doric is the most frequently employed of the classic orders in modern work. The Tuscan appears occasionally, the

most charming example of its use being in the decoration of the entrances to the Riding Academy in Brooklyn, N. Y. To even summarize the influence of the basilica plan, construction and decoration upon the architectural forms of later ages would be to outline the development of Early Christian and Medieval Art, a subject reserved for future treatment. It is sufficient to say that practically all churches are adaptations of the civil basilica. The Thermae are the prototypes of many of our great railroad stations, museums, galleries and government structures, their chief rooms being inspired, in decoration, lighting and general distribution by the tepidaria of the Imperial baths. The placing of the Roman temple upon a high podium and providing a monumental approach by means of a colossal stairway finds an echo in many of our modern works. At times this Roman stairway is combined with a Greek façade, as in the sub-treasury on Wall street, New York, and sometimes the designer builds the Roman pedimented temple front on the high base and leaves off the steps, as in the Broad street façade of the New York Stock Exchange.

If the student will go about with his eyes open and attempt to classify, relate and trace to their origins the architectural forms that he observes in his daily walks, keeping in mind the *elements* of the *structural arts* that have been treated in this series of nine articles, he will find that a new world of interest will be opened up. The present will be vitally related to the past. The ancient civilizations will constitute the frame for a living science. With the development of an increased faculty of observation, a greater fullness of life will be experienced, and art and its multiform expressions will be felt to be, not a thing mysterious and apart, but the sane and logical reflection of actual life, and as such the most certain expression of the character of a people.

SEARCH AND REVIEW QUESTIONS ON THE REQUIRED READING WILL BE FOUND IN THE ROUND TABLE SECTION AT THE BACK OF THIS MAGAZINE.

(End of C. L. S. C. Required Reading, Pages 310-399.)

Halley's Comet and Others

By Frank Loxley Griffin, Ph. D.

Assistant Professor of Mathematics, Williams College.

IT is not strange that the peoples of antiquity stood in great awe of comets, and saw no similarity between these bodies and the planets, whose wanderings among the fixed stars were so well known. For, coming at irregular intervals and hence unexpectedly, comets appeared with startling suddenness, their long tails extending like streamers of light far out among the stars, and their heads often larger and brighter than the planets yet nebulous and shining with a strange diffuseness, showing sometimes a bright central nucleus of a fantastic shape. (The English name for these bodies comes from the Latin *coma*, hair,—a name given because of the fancied resemblance to a terrible fiery mane.) The apparition might occur in any part of the heavens, followed by rapid flight past the sun, and early disappearance. Moreover, in the middle ages, superstition was enhanced through the coming of brilliant comets at several crises of history; for example, in 1066 just before the Norman conquest of England, and again during the Turkish invasion of central Europe in 1456.

Still, some of the ancients believed that these bodies are subject to definite laws; and Seneca is credited with this interesting prediction:

> "The time will come when our descendants will wonder that we were ignorant of things so simple. Some day there will arise a man who will demonstrate in what region of the heavens comets take their way; why they journey so far from the other planets; what their size."

This prophecy was fulfilled in Sir Isaac Newton and his friend Edmund Halley. In the monumental work, "Philosophiae Naturalis Principia Mathematica," published in 1687 at Halley's expense, Newton showed why a comet must move in the curve it follows, and how this path may be ascertained from observations of the comet. Halley in turn applied the methods his friend had developed, making a laborious computation of many orbits, with a remarkable re-

sult. Comets seen in 1531, 1607, and 1682 were found to have traveled nearly the same path; which fact suggested that these were in reality one comet on several returns from a long journey into space, and caused Halley to offer his famous prediction that the year 1759 would witness another return of the same celestial wanderer. On Christmas eve, 1758, the comet was indeed sighted, and in the following spring was generally visible,—some seventeen years after the death of Halley, to whom thus belongs the credit of first foretelling the return of a comet. Later investigation has shown that this comet, which so properly bears Halley's name, has been observed on each return, at intervals averaging about seventy-seven years, since the date 11 B. C. It was seen in 66 A. D. before the destruction of Jerusalem, being mentioned by Josephus in his sixth book as a sign from heaven. Other appearances which caused excitement occurred in 451, when Attila the Hun was defeated at Chalons, and in 1066 and 1456; for the comets of the latter two dates, mentioned above, were none other than Halley's. In nearly every case, the European accounts are practically worthless for purposes of identification, as the Chinese observers alone had sense enough to record the course of the comet among the stars. Crude drawings of this comet at several appearances have come down to us, and more skilful ones by able observers in 1835, but of course no photographs.

On the present trip the comet was first detected photographically by Wolf at Königstuhl on September 11 last, and was first seen by Burnham at the Yerkes Observatory on September 16. The comet's westward motion together with the sun's eastward course brought the comet too near the sun to be visible to the naked eye until the end of April, after it had passed to the west of the sun. It will by May 8 be visible in the east for two hours before sunrise; but will soon be obscured by sunlight, passing the sun again on May 18, after which despite the moonlight for a few evenings just at nightfall it will be a conspicuous object in the west

Doubtless many fine photographs of the comet will be obtained this year.

The superb achievement of Newton and Halley (to really appreciate which one must know the extreme mathematical difficulties encountered) represents in a typical way the difference between modern scientific theories and the speculations of ancient philosophers, who were more ingenious at asking questions than at answering them.

The nature of comets. Although the paths of comets have presented no mystery since Newton showed them to be curves of the same general class as the planetary orbits, there remain several points of uncertainty as to the physical character of the bodies themselves. The vast majority of comets are never visible to the naked eye; and though nearly all which can be thus seen (as well as many which remain "telescopic") have tails, more comets are without these appendages than with them. Likewise, while in some comets there is a prominent nucleus (the largest recorded being about the size of the earth, and the brightest having been visible at noon), and while any comet to be seen by the naked eye must have a head which, or part of which, is bright and star-like, many small comets have no nucleus.

The one characteristic feature which all comets have is the *coma,* a nebulous body usually round or oval, whose size ranges from practically nothing in the case of bodies too small to detect with the best instruments, up to that of the comet of 1811, whose diameter of 1,100,000 miles exceeded the sun's by one-fourth. In many comets the head consists entirely of this coma; in the others, of the coma and its comparatively small included nucleus.

The light received from comets is whitish or gray, though cases have been reported of yellowish or ruddy light. The source of the light is a matter of dispute: of course the sun shines upon these bodies as upon all other members of his system; but there is evidence that we see comets not merely by this illumination, but also by reason of light of their own. The spectroscope shows this light to be of the

Plate I.

Daniel's Comet of 1907. Photographed by Barnard at the Yerkes Observatory.

The head was elongated and about as bright as the north star. The tail consisted of many rays, of which at least four can be counted; but was rather faint, and through it there are visible many dashes or streaks. These latter are the trails of star-images, which moved in the field of view since the telescope was kept pointed at the comet.

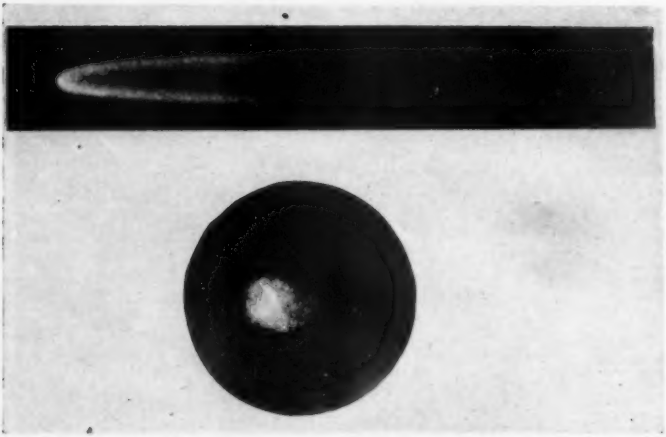


Plate II.

Halley's Comet in 1835. Drawn by Admiral Smyth

The upper drawing shows the comet in November when very near the sun; the tail is long and a nucleus is discernible. The lower picture was drawn a month earlier, the comet having very little tail, but being in a good position for observation; thus the horn-shaped nucleus is conspicuous. The latter feature resembles one prominent in certain drawings made in 1682.

same quality as that emitted by glowing vapors of certain carbon compounds.

When first visible in a telescope, a comet has a very small hazy image, and can sometimes be distinguished from dim stars only by its motion. Indeed its detection at all is something of a marvel, as will be apparent from the accompanying photographs of Halley's comet taken soon after its re-discovery by Wolf last autumn.

At first only the round coma is seen, which grows brighter as the comet approaches the earth, perhaps showing a nucleus. Sometimes the coma becomes elongated and rough on the side away from the sun, and a tail begins to develop; the growth is frequently very rapid, even as much as one degree a day (twice the apparent diameter of the moon). Tails at their best may measure over 100,000,000 miles in length, but contain very little matter, being hollow and composed of exceedingly rarified material. It has been

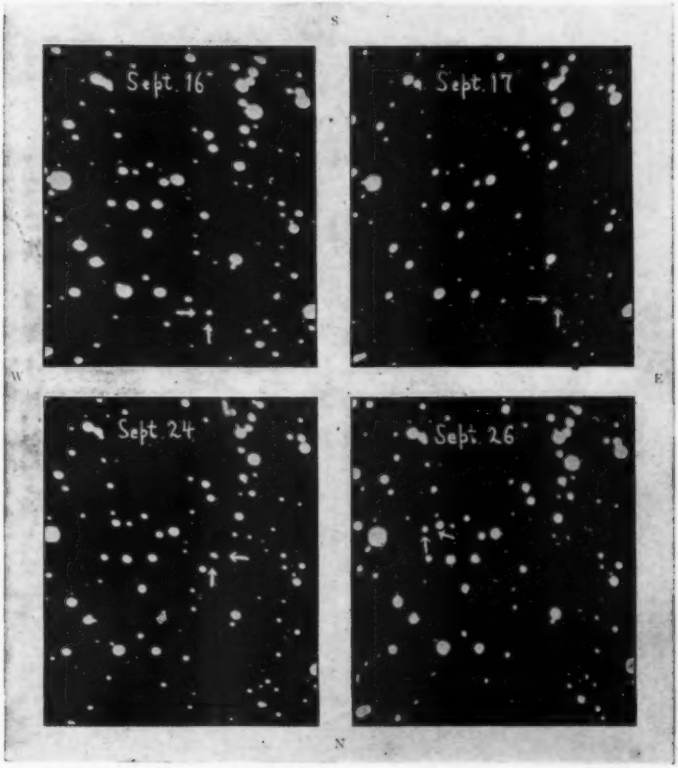


Plate III.

Halley's Comet in September, 1909. Photographed by Lee with the Two-foot Reflector of the Yerkes Observatory

The arrows point to the comet and also indicate its direction among the stars. The difference of brightness in the different pictures results from different weather conditions and unequal times of exposure. The comet is near the limit of visibility for the great refracting telescope, and the fainter stars shown are never visible, save in photographs of long exposure.

said, though perhaps with exaggeration, that an entire tail if compressed would about fill a hat-box!

This very thin matter which is given off by the head assumes a position nearly in line with, but away from, the sun; thus as a comet approaches the sun, its tail lags somewhat behind, while in receding from the sun a comet is preceded by its tail. The force which produces this phenomenon is imperfectly understood as yet, some scientists holding to a theory of electrical repulsion, and others accepting a recent explanation by Arrhenius. This Swedish savant utilizes Maxwell's discovery that a beam of light exerts a pressure in the direction of its propagation; and shows that, upon matter very finely divided, this pressure could

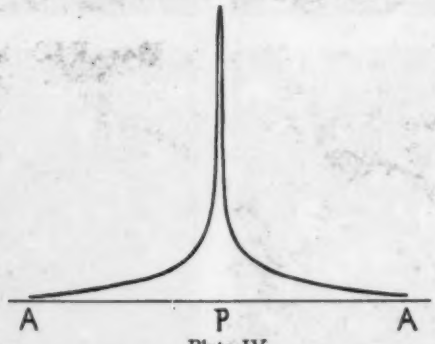


Plate IV.

Changes in the Speed of Halley's Comet.
Equal spaces horizontally represent equal intervals of time, and the vertical distance to the curve at any point shows the speed at that time. The greatest and least heights in the curve represent respectively the speed at perihelion (P) and that at aphelion (A).

overcome the gravitational attraction which is pulling the head toward the sun. That the coma is less affected than the tail, is analogous to the fact that a wind may blow dust along, while leaving pebbles undisturbed. Thus the longer, narrower tails consist of rarer material than do short stubby tails. The hollowness of the tails is due to the greater efficiency of the repulsive force at the edge of the head (as

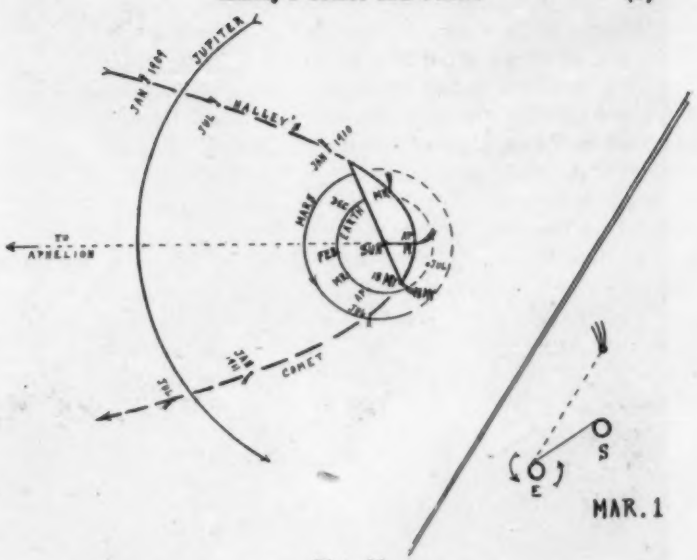


Plate V.

The Paths of Halley's Comet and Three Planets.

The ecliptic is in the plane of the paper, the reader viewing it from the side of the north star. Where the comet's path is shown by a broken line it is back of the ecliptic; where drawn full, in front. The full straight line drawn slanting through the sun is the *line of nodes*, where the comet's plane cuts that of the earth. The comet passed this line, at the "ascending node," on Jan. 18; and will again cross it, at the "descending node," on May 18, when the earth will pass through the tail. The other positions, except the perihelion on April 19, are shown for the first days of the months named. The comet's aphelion on this scale is at a distance of ten inches from the sun along the dotted axis of symmetry.

The small diagram in the right-hand corner, not drawn to scale, shows the comet as seen above the horizon on March 1 by an observer where the sun has just set.

seen from the sun), less resistance being encountered there than in the central part.

The extreme tenuity of comets' tails is shown by the fact that stars are observed through them shining with undiminished brightness, though Herschel reports a case where a star could be seen near the head by glimpses only. In photographs the star-tails are often obliterated by a

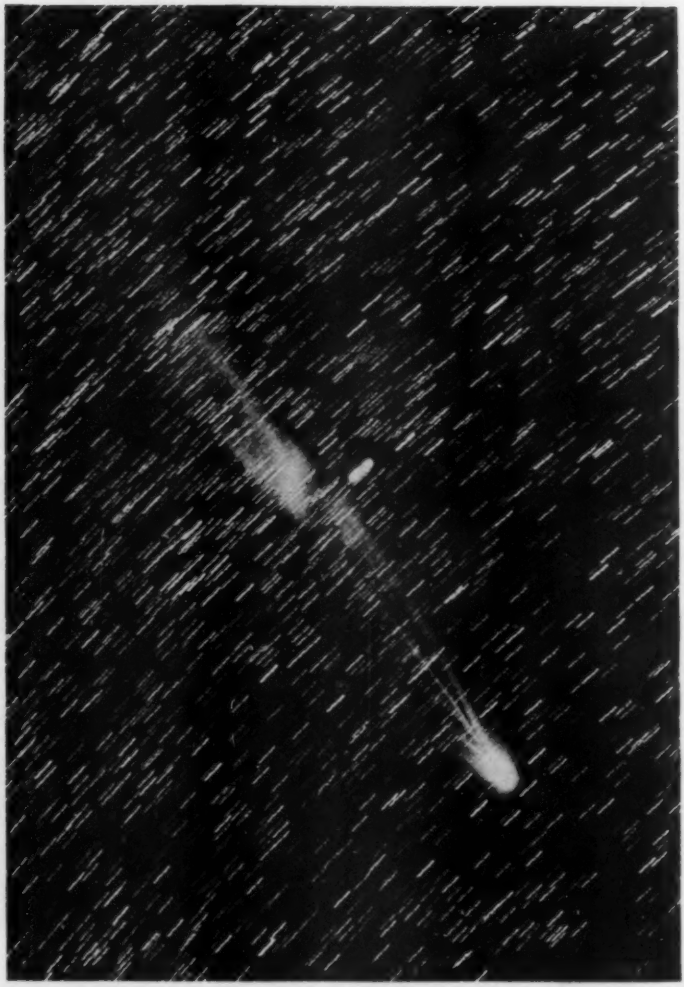


Plate VI.

Morehouse's Comet of 1908, photographed October 1 at the Yerkes Observatory.

Notice the wide tail at some distance from the head, connected with the latter by fine streamers. See also the star-trail visible through the middle of the head.

comet's head; but here it should be remembered that the stars, moving in the field, spread their light along their trails, while that from the comet is concentrated upon one spot on the plate. [See plates I, VI and VII.] Again, comets have passed directly between us and the sun, and even their nuclei have been invisible against the face of the sun. This is disputed in one or two cases, and as Halley's comet will make such a "transit" on May 18, preparations have been made to observe the phenomenon carefully. Our knowledge as to the constitution of comets is roughly summed up by Chambers as follows:

> "Probably the heads are a mixture of solid and gaseous matter, and the tails are gaseous, being the result of the volatilisation of some of the solid matter of the heads. . . . To say what is the size of the solid particles is impossible: paving stones, brick-bats, and grains of sand have in turn been suggested by people fond of speculation."

The total amount of matter in a comet rarely if ever exceeds that in an iron ball of a diameter of 150 miles.

In the event of a collision between the earth and a comet, what? Much excitement and worry were caused in 1832 when it was learned that Biela's comet would on a certain day pass exceedingly near a certain point of the earth's orbit, but fear was allayed by the later information that the earth was not to reach that point of its orbit until a month later! Our planet has several times passed through the tails of comets, with no result beyond a faint glow in the sky; and probably the only observable effect of a direct collision with the head of a comet would be a dazzling display of "shooting-stars." It is uncertain whether any particles in the nucleus would prove of sufficient size to reach the ground, or whether all would be consumed by the frictional heat generated in their flight through our atmosphere.

Comets are believed to wear out gradually through the loss of matter on successive approaches to the sun; and certainly their appearance undergoes profound changes both during a single trip and from one apparition to the next. We thus have the rather anomalous fact that a comet must be recognized and identified on each successive return, not

by its looks, but by its motion among the stars, though this apparent path is sure to be different each time!

The movements of comets. To understand the movements of Halley's comet this spring, or the identification of comets seen in different years, we need to recall some facts concerning motion as produced by the gravitational attraction of one body upon another. Any object moving straight toward the sun will have its motion constantly hastened by the mighty pull of the latter and will soon fall upon it; while if moving in any other direction, the former will under the same attraction have its path deflected more nearly toward the sun. Why then does a body not always keep on approaching the sun until the two come together? Well, the force exerted by the sun has had the further effect of

Plate VII.
The Morehouse Comet, photographed November 14.
The tail is of great brightness and density, comparatively; and shows a large number of streamers leaving it at considerable angles. The tail shows peculiar curves and seemed to undulate.

greatly increasing the body's speed; and the faster a body moves, the greater is the force required to deflect it from the straight line in which it is tending to move at any instant. Presently the sun's pull is nearly balanced by this centrifugal force, or tendency to fly away, and the orbit is for a time nearly like an arc of a circle; then the centrifugal force overbalances the attraction,—the body stops approaching and begins to recede. The body does not, however, come to rest at this instant,—in fact this is the moment of its greatest speed; it is merely passing the point nearest the sun, in that curve which the combined effects of speed and attraction force it to travel. The sun's gravitational force will now retard the motion, and if the speed is not too great to be finally overcome, the body will presently swing around and again approach the sun. How near to the sun it has passed, the *perihelion* distance, depends upon the relation which the speed at any instant bears to the position and direction of motion; and the same relation settles whether the body will recede indefinitely or what will be the greatest distance from the sun attained, the *aphelion* distance.

The remarkable variation of the speed during a trip from aphelion to perihelion and return is shown for Halley's comet in the diagram (Plate IV.). It is surprising that the greatest speed (about 3,000,000 miles a day) should be some sixty times the least speed, and more than twelve times the average. Thus in the month of April alone when nearest the sun this comet traveled about as far as during the years 1870 to 1874 inclusive; and in a single year beginning last October it will have journeyed as great a distance as during the years 1860-1885! But we must bear in mind that the aphelion distance for this comet is about sixty times its perihelion distance, the latter being less than three-fifths of the earth's average distance from the sun, while the former is nearly thirty-six times this astronomical unit. The reason that the speeds of planets do not vary much along their orbits is, that their perihelion and aphelion distances are not very different, such orbits being nearly circular.

In just what curves do bodies move under the sun's attraction? Strangely enough, in the simplest class of curves known: the so-called "conic sections." (These curves may be either the special ovals called ellipses, or the curves called parabolas and hyperbolas which are open at one end, like ovals stretched until one end is indefinitely far away. The class-name suggests one method of obtaining these curves: pass a plane through an ordinary circular cone, and you obtain as the intersection of the plane and the conical surface one of these curves,—ellipse, parabola or hyperbola, according to the angle between your plane and the axis of the cone.) Strictly speaking the orbits are never *exact* conic sections, since the mutual attractions of comets and planets produce a slight undulation in their motions.

Bodies traveling in ellipses will approach the sun at regular intervals, while those moving in parabolas or hyperbolas will not be seen again, since in such curves there is no point which is the farthest from the sun.

The inner comets go round the sun in the same general direction as all the planets, while the outer ones of larger periods, such as Halley's, move in the opposite direction. [See plate V.] But unlike the planets whose ellipses all lie in nearly the same plane, comets have their orbits tilted at all sorts of angles to the plane of the earth's motion (the *ecliptic*), and consequently may appear in any part of the heavens. The same tilting also greatly reduces the chance of a collision with a comet. For all points common to the ecliptic and the plane of the comet's orbit form a single straight line; and such an encounter can occur only when both the earth and the comet are crossing that line at the same point and same time!

Let us consider now the movements of Halley's comet this year. The side of the earth away from the sun rotates forward in the direction traveled along the orbit; thus on March 1 the sun would set first. But on March 25 the comet passed behind the sun (though not right in line with

the latter), and in April was consequently to the westward among the stars, setting and rising earlier. After the second conjunction on May 18 the comet will evidently be seen to the east of the sun again, and near it for a while. The earth's motion around the sun will bring the latter again between us and the comet in September; and, though the best telescopes will find it later for a short time, few persons now alive will ever see it again.

How orbits are computed and predictions made. How are the future positions of a comet predicted? The first problem is to find the exact location, shape, and size of the *orbit;* and later, to find the position of the *body* in this curve at different times.

The *position of the plane* containing the orbit can be completely described by telling (a) the direction of the line of nodes through the sun, and (b) the inclination, or angle between the ecliptic and the comet's plane. The *location of the orbit in its plane* is known if we can ascertain (c) the direction of the axis of the orbit,—i. e., the angle between lines drawn from the sun to the perihelion and to the ascending node,—(d) the perihelion distance, and (e) the "eccentricity," a geometrical quantity affecting the shape of the orbit as regards elongation or flattening. Lastly, the *positions of the comet* in this orbit at any time can be computed from the laws of motion in conic sections, if we know further (f) the instant at which the perihelion is passed. Thus six quantities (a)-(f) called *elements* need to be known before a time-table or *ephemeris* can be computed for the comet: two to fix the position of the plane; three to locate the orbit in its plane, and one to fix the position of the comet in its orbit.

Some of us will recall that to find algebraically six unknown quantities there are needed six equations. Well, the six equations are obtained by observing the comet's position at three different times. Consider what is recorded by each observation: merely the direction of the line of sight from the observer to the comet; that is, two angles

which locate this line with reference to two planes fixed among the stars. The measurement of these two angles furnishes two relations (of exceedingly complicated character) among the six desired quantities; and consequently three observations make it possible to solve for the six elements. When this has been done the figuring out of the time-table is comparatively simple.

The computation of cometary orbits is a remarkable achievement of the human mind; but when we consider the information out of which the science has sprung,—*merely the changed directions of bodies* at different times,—the feat is seen to be nothing short of marvelous. This is not saying that the computation of an orbit now requires any unusual scientific ability; the process is well known and it remains but to calculate accurately the numerical expressions required. The men who laid the foundation and showed *how* to solve such problems: Copernicus, Kepler, Halley, Laplace, Olbers, Gauss, and above all, Newton,—these men showed masterly genius.

The discovery and naming of comets. Occasionally even now-a-days a comet will be discovered with the naked eye before being picked up in a telescope! Again, some are found photographically through their trails on star-plates; but nearly all are discovered visually with telescopes called comet-seekers. Such instruments have eye-pieces of low magnifying power and give a large field of view. The observer sweeps the sky near the sun soon after sunset or shortly before sunrise, since most comets become visible only when fairly near the sun. Following a discovery many instruments are turned upon the part of the sky in question, and photography comes into play. A tentative ephemeris is quickly computed, to assist in following the comet; and a more accurate determination of the orbit is left until later.

Comet-hunting has been taken up in the last three decades more energetically than ever before, and in this activity four Americans (Brooks, Barnard, Perrine, and Swift) have led, having credit for more new comets than all their

contemporaries. Out of some five hundred comets observed since the telescope was invented (1609) about one in five has been visible to the naked eye, and perhaps one in thirty has been really magnificent.

The name first given a comet is the year of its discovery preceded by a letter showing the order of discovery: thus *a* 1910 was the first comet discovered this year, being one that was visible to the naked eye for a few evenings in January. The name later given is the year of its perihelion passage followed by a small Roman numeral showing the order in that year; and in this order, often very different from that of discovery, the comets are finally cataloged. Thus, Comet *c* 1905 became 1906 (I), while *b* 1906 became 1905 (IV). A noteworthy comet often carries also the name of the discoverer or investigator, as Daniel's comet of 1907 (IV), or Halley's comet.

If two comets appear at different times whose orbits are ellipses having the same elements (a)-(e), and if the times of perihelion passage differ by about the period required for a trip around such an orbit, the comets are pretty sure to be the same one. This likelihood is converted into certainty if the computed effect of the planetary disturbances is found to be equivalent to any slight changes in the elements from one apparition to the next.

Some remarkable comets. Without searching the fantastic records of antiquity, we know of some very peculiar comets:

1. Encke's comet is interesting for its short period, having been observed on thirty trips since its discovery in 1786, several times as a naked-eye object. The comet did not receive this name until its eleventh recorded appearance, when Encke performed for it a service like Halley's for his comet, identifying the comet of 1819 with those of 1786, 1795, and 1805, and predicting its return in 1822. The period is shortening gradually, for a reason not understood, which indicates that the comet is gradually getting nearer the sun and will ultimately fall upon it.

2. In February, 1826, Biela discovered a comet, which computation showed must appear about every six and one-half years, and which was identified with comets seen in 1772 and 1805. The excitement occasioned by the expected return in 1832 has been mentioned above. Later, in January, 1846, an astounding phenomenon occurred: a small comet separated from the large body, and the two traveled on, side by side. The doubling was first seen at Washington but was fortunately observed elsewhere later. Fortunately we think,—for a similar record from antiquity had been received with derision. On the next trip (1852) the two comets were still moving side by side; but in 1859 neither appeared, and *neither has been seen since!* For this mysterious disappearance, certain now after eight failures to return, a most interesting reason has been suggested. Several times when Biela's comet should have passed close to the earth, there have been profuse showers of meteors or shooting-stars. As there are other meteoric showers that occur periodically, astronomers are inclined to believe that Biela's comet and others have been disrupted, and that the meteors of these showers are the fragments, encountered by the earth.

3. Morehouse's comet of 1908 (iii), while never visible to the naked eye, was one of the most beautiful and erratic ever photographed. The first startling change occurred on October 1, when the whole tail seemed (to visual observers) to have broken away from the comet; the photograph shows, however, that the connection was not absolutely lost. New tails were frequently formed and lost; the changes being very rapid,—cyclonic. None of these changes could have been adequately recorded with the means of thirty years ago, for while astronomical photographs were first taken in 1858, the first really good ones were obtained in 1881.

4. The great comet of 1843 passed very near the sun, within about 100,000 miles of the surface. Its tail would reach half-way from the horizon to the zenith, and was very

bright. Some computers assigned a period of several hundred years, while others claim that the orbit is hyperbolic. How can there fairly be any disagreement on such a matter? Well, for one thing, observations are never *absolutely* exact, and this comet moved through two hundred and ninety degrees of its orbit (out of a possible three hundred and sixty degrees) in a single day! And secondly, the small part of an orbit through which we can follow some comets can be represented pretty closely by parts of several ellipses, or in some cases by parts of either hyperbolas, parabolas, or greatly elongated ellipses.

The origin of comets. A comet moving in either a parabola or an hyperbola recedes indefinitely from the sun, with a continually decreasing speed, but there is this difference: in any hyperbola there is a certain limit below which the comet's speed never diminishes, while in a parabola the speed finally becomes as little as we please to name. Any disturbance by a planet, which reduces by the least bit the speed of a comet whose orbit is parabolic, will make that comet move in an ellipse and become "periodic," while much more violent action is necessary to "capture" a comet moving in an hyperbola. At times a planet may produce the reverse effect, hurling away into space a comet formerly periodic.

It is unsettled whether (1) all comets come from without the solar system, some being captured and forced to stay, or (2) all comets originate within the system, some being cast out, or (3) some originate inside and some outside. (To appreciate the reason for arguing such a question we should keep in mind the extraordinary isolation of our system. Representing the earth's average distance from the sun by *an inch*, the outermost known planet would be two and one-half feet away, Halley's comet would recede to a distance of three feet, but the nearest fixed star would be *over four miles away!* Impassable as this great gulf seems, comets which leave us along hyperbolic paths must cross over and come under the influence of another sun.

The only way they could return to us would be to find a sun so placed that, after leaving its control, their orbits would again turn toward our solar system.)

An objection to the first view above, applying also to the third in lesser degree, is that more comets should come to us in hyperbolic orbits than do so, particularly among those meeting our sun in his flight through space.

On the other hand, it was formerly supposed that the retrograde motion of the outer comets, and the great tilting of their orbits, would contradict the second view. But this objection was based upon the old Laplacian hypothesis of a ring-nebular origin of the solar system, and does not stand if we accept the more recent "planetesimal hypothesis" of Chamberlin and Moulton. In fact the tremendous distances from which some periodic comets come are suggestive of matter drawn far from our sun by a passing star. But of course other reasons may yet be found for regarding comets as originally foreign to the solar system.

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II. Chapters on Comets. See text-books by C. A. Young, G. C. Comstock, F. R. Moulton, D. P. Todd, H. A. Howe; also various encyclopedias and the popular works by Simon Newcomb and Sir Robert Ball.

III. Magazine articles. "Halley's Comet," by E. Doolittle in the *Popular Science Monthly* for January, 1910. "Photographing Comets," by E. E. Barnard in the *Scientific American Supplement* for December 18, 1909. Several other recent articles are listed in the *Reader's Guide to Periodical Literature.*

The Celestial Menagerie

THE simple imaginations of the ancients peopled the heavens with heroes and heroines who were supposed to find in this stop-over to Olympus reward and consolation for their earthly efforts and sufferings. Just as the ancient mind attributed to divinities the habits and virtues and vices of human beings, so it gave to the inhabitants of the celestial ether animal companions, the starry counterparts of the beasts of myth and tradition.

Observation showed primitive astronomers that the sun in its annual course made its way through a series of twelve constellations, its position being in a different one each month. Aries, the most western sign of the Zodiac, represents the golden-fleeced ram that rescued the Thessalonian children, Helle and Phryxus, from their cruel stepmother. As he sped over land and sea, bearing them on his back, the girl fell into the strait afterwards named Hellespont to commemorate her death. The boy reached Colchis in safety, showed his gratitude to the ram by sacrificing him to Jupiter, and his good feeling to AEetes, the King of Colchis, by giving him the animal's golden fleece. The reputation of the strange treasure spread abroad, and Jason collected a band of brave Greek youths who called themselves Argonauts, from the name of their ship, the *Argo*, placed later among the constellations, and set forth to compass the adventure. After encountering and escaping many dangers, the heroes reached Colchis only to find that obtaining the fleece was contingent upon the successful performance of what even Hercules would have considered "Labors." Jason proved himself a man of resource in that he enlisted the sympathy of the king's daughter, Medea. She was a mistress of magic, but her advice was charged with the good-sense which is supernatural only because it is rare. By opposing to the fire-breathing bulls the serenity that calms all braggarts and blusterers Jason subdued them to the yoke; and by fomenting strife among the fighters sprung from the teeth of

Medea, from a Painting by Sichel.

the dragon slain by Cadmus he turned their unwelcome attention from himself to each other, just as has been done with quarrelsome people many a time before and since. With these obstructions disposed of and the watchfulness of the dragon guardian of the fleece (now evident in the sky as Draco) averted by the use of a fragrant sleep-compelling liquid—a symbol, perhaps, of the gentle answer that turns away wrath—Jason seized the fleece, and sailed home with his bride and his companions.

The zodiacal sign next in order is Taurus, the bull whose form Jupiter assumed when he carried off Europa. This story was told in the February number of THE CHAUTAUQUAN, and that of Gemini, the Twins, in March.

Cancer, the fourth sign, represents the crab sent by Juno to annoy Hercules by biting his feet while he was striving to overcome the hundred-headed water-snake, Hydra, which also has a commemorative place in the sky. The Egyptians represented Cancer as a scarab. Another labor of Hercules is immortalized by the presence of Leo on the heavenly scroll. Jupiter is said to have decreed the constellation as a record of the hero's contest over the beast that ravaged the Nemean valley. The Hebrews recognized the same figure, but to them it symbolized the Lion of Judah.

According to Aratus the constellation Virgo represents Justice, in the Golden Age an inhabitant of earth, in the Silver Age a visitor of the earth, in the Bronze Age a refugee from earth, with a constant abode in heaven. After leaving Justice the sun occupies Libra, the Scales of Justice, and then passes into Scorpio, against whose onslaught Chiron, the wisest of the centaurs, known in the sky as Sagittarius, the Archer, is bending a threatening bow.

Gaia (Earth) had a son, Typhon, a monster compounded of the horrors of the fiercest beasts. Today, when he is buried in the depths of the ground, his hot breath mounts through the craters of volcanoes or rolls scorching across the desert, and when he was not so confined he car-

Two Women with Zodiac, from a Painting by Raphael.

ried terror even to gods and demi-gods. Pan, the son of Mercury and a wood-nymph, and himself the god of fields and flocks, fled before him and escaped only by being transformed into a goat, Capricornus, which scampered nimbly into the tenth place in the Zodiac. Shelley makes Pan sing:

"From the forests and highlands
We come, we come;
From the river-girt islands
Where loud waves are dumb
Listening to my sweet pipings.
The wind in the reeds and the rushes,
The bees on the bells of thyme,
The birds on the myrtle bushes,
The cicale above in the lime,
And the lizards below in the grass,
Were as silent as ever old Timolus was,
Listening to my sweet pipings."

Venus, the goddess of love and beauty, found her gentle arts of no avail against the unruled violence of Typhon, so she and her son Cupid took refuge among the stars in the shapes of the two Fishes which make up the twelfth sign. Here the sun ends its annual round after passing Aquarius, the Water-bearer, the heavenly representative of Ganymede, the cup-bearer of the gods, who is pouring a draught to refresh the Southern Fish (Piscis Australis). Ganymede was a Trojan boy who was borne away to Olympus by Jupiter in the guise of an Eagle, the starry Aquila, which, as the king of birds, justly held a place by the side of the king of gods and men. Elizabeth Barrett Browning translates one of Ovid's *Metamorphoses,* in part, as follows:

"But sovran Jove's rapacious bird, the regal
High percher on the lightning, the great eagle,
Drove down with rushing wings; and thinking how,
By Cupid's help, he bore from Ida's brow
A cup-boy for his master, he inclined
To yield, in just return, an influence kind;
The god being honored in his lady's woe."

The animals of the Zodiac are far from being the only members of the Celestial Menagerie. Ursa Major was a nymph, Callisto, beloved by Jupiter. Juno's jealousy turned

Jupiter.

Dejanira and Nessus.

her into a bear, and for a time she haunted the forests. One day her son, Arcas, narrowly escaped slaying his mother and in order that so shocking an accident might not be repeated, his father, Jupiter, changed him into a bear also, and placed mother and son in the heavens as the Great and Little Bear. Juno was angry at this defeat of her evil purpose and gained from Oceanus a promise that her rival with her child never should have rest beneath his waters. That is the reason why the two bears follow each other in never-ending round about the Pole in the course that Lowell describes in "Prometheus:"

> "One after one the stars have risen and set,
> Sparkling upon the hoar frost of my chain;
> The Bear that prowled all night about the fold
> Of the North-star, hath shrunk into his den,
> Scared by the blithesome footsteps of the Dawn."

Opiuchus, depicted as an old man, holds a writhing serpent (Serpens) in his hands. Draco, winding between the Great and Little Bear, is on guard in the heavens as he used to be on earth, for there he aided the Hesperides in their watch over the golden apples and was killed by Hercules, say the unbelievers in the tradition that he was the

Cupid and Dolphin.

Ganymede and Jove's Eagle.

caretaker of the Golden Fleece. Still another theory makes Draco the dragon tossed into the sky by Minerva when she was warring with the Giants.

In similar fashion there are a number of traditions as to the original form of the heavenly hounds. Two of them, the Canes Venatici, are the hunting dogs that are ever in pursuit of the Bear, unobservant of the small nearby stars called "The Female Wolves" and "The Whelps of the Hyenas." The Greater Dog (Canis Major) borrows its fame from one of its components, Sirius, the Dog Star, the brightest star in the whole sky, known from earliest times as the faithful escort of Orion and the prophet of the Nile floods. The Lesser Dog (Canis Minor) is variously thought to be one of Diana's hunting dogs, one of Orion's pack, the Egyptian dog-headed god, Anubis, and one of the dogs that slew Actaeon after he had been turned into a stag by Diana as a punishment for his unwitting intrusion upon her privacy.

By people who like the theological interpretation of mythological stories, the Dolphin is thought to represent Jonah's whale, but the usual belief makes it the sea-beast that rescued Arion from drowning at the hands of murderous sail-

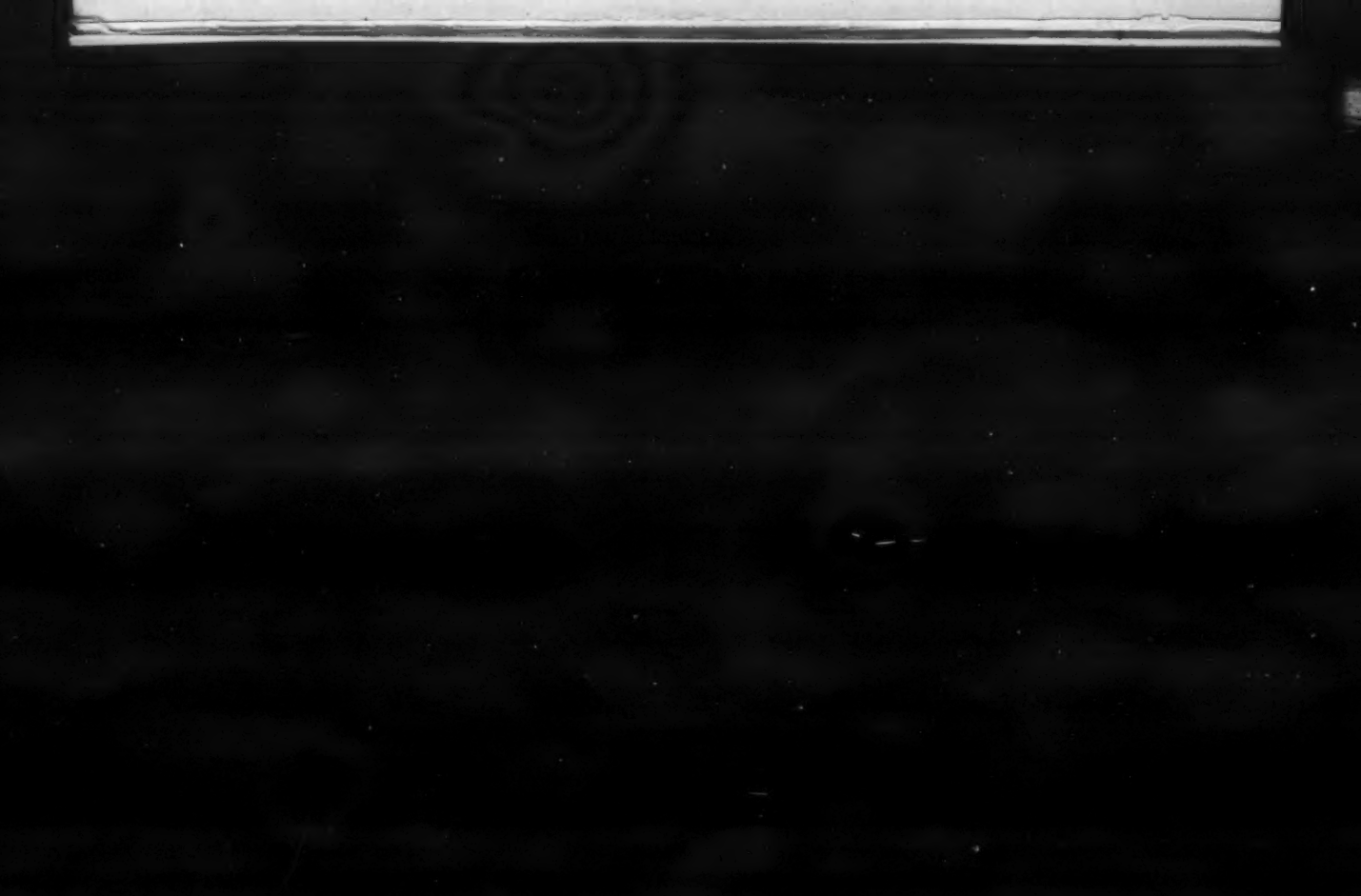
Pan and the Bear Cub.

ors. The musician was returning to Corinth from Sicily where he had won a valuable prize. The seamen of his boat coveted his wealth and prepared to slay him to ensure his silence as to their robbery. He begged the privilege of striking his lyre once more, and then he cast himself into the sea. He was not fated to die in this way, however, for a dolphin mounted him upon his back and bore him to land, where he made his way to the Corinthian court and confounded the ruffians by appearing before them when they assured the king that they had left his favorite in a foreign land.

Spenser describes as follows Arion in the train of Neptune:

> "Then was there heard a most celestial sound
> Of dainty music which did next ensue,
> And, on the floating waters as enthroned,
> Arion with his harp unto him drew
> The ears and hearts of all that goodly crew;
> Even when as yet the dolphin which him bore
> Through the Aegean Seas from pirates' view,
> Stood still, by him astonished at his lore,
> And all the raging seas for joy forgot to roar."

Another sea creature immortalized in the sky is Cetus, the Whale, variably known as the leviathan of the Book of



Job and as the monster sent by Neptune to seize Andromeda. (See CHAUTAUQUAN for January, 1910.)

Near the Dolphin are the Fox and Geese whose name recalls the childish game that goes back to antiquity. In the same part of the sky is Cygnus, placed in the heavens, like Taurus, in commemoration of one of Jupiter's metamorphoses, this time his assumption of the form of a Swan when he wooed Leda, the mother of the twins, Gemini.

Several insignificant constellations seem to have been given their names because of their fancied shape, and to have no especial myth connected with them. Of these are Musca the Fly, Columba the Dove, Camelopardalis the Giraffe, Equüleus the Pony, Monoceros the Unicorn, described by Pliny, Lepus the Hare, mentioned by Cicero, Lupus the Wolf, the Lynx, the Ass's Colts, standing in hungry mood on each side of the Manger, and the goat and kids borne in the arms of Auriga the goatherd.

In her earthly life Corvus, the Crow, was no less a personage than a princess of Phocis. Unfortunately for her continued career among the royalties of her time she attracted the notice of Neptune. In order to escape his unwelcome attentions she put on the form of a raven and took refuge in the heavens.

Cerberus the three-headed dog that guarded the entrance to the lower regions, is shown in the sky in the grasp of Hercules, one of whose labors required him to bring the beast to the upper world. In a translation of another of the *Metamorphoses,* Mrs. Browning says of Psyche and Cerberus:

"A mighty dog with three colossal necks,
And heads in grand proportion; vast as fear,
With jaws that bark the thunder out that breaks
In most innocuous dread for ghosts anear,
Who are safe in death from sorrow; he reclines
Across the threshold of Queen Proserpine's
Dark-sweeping halls, and there, for Pluto's spouse,
Doth guard the entrance of the empty house.
When Psyche threw the cake to him, once amain
He howled up wildly from his hunger-pain,
And was still after."

Bellerophon and Pegasus.

Pegasus, the winged horse, of whom Spenser says,

> "Then whoso will with virtuous wing assay
> To mount to heaven, on Pegasus must ride,
> And with sweet Poet's verse be glorified,"

sprang from the blood of Medusa when Perseus cut off her head. Minerva tamed him and gave him to the Muses. When the youth Bellerophon went forth to destroy the fire-breathing monster, Chimaera, Minerva gave him a bridle at sight of which the magic steed allowed himself to be mounted and to be used as a point of vantage for the successful attack that followed.

Longfellow's poem, "Pegasus in Pound," symbolizes the poetic fancy in the trammels of unsympathetic environment.

PEGASUS IN POUND.

Once into a quiet village,
  Without haste and without heed,
In the golden prime of morning
  Strayed the poets' winged steed.

* * * * * *

Thus, upon the village common,
  By the schoolboys he was found;
And the wise men in their wisdom
  Straightway put him into pound.

Then the sombre village crier,
  Ringing loud his brazen bell,
Wandered down the street proclaiming
There was an estray to sell.

And the curious country people,
  Rich and poor and young and old,
Came in haste to see this wondrous
Wingéd steed with mane of gold.

* * * * * *

Patiently and still expectant,
  Looked he through the wooden bars,
Saw the moon rise o'er the landscape,
  Saw the tranquil, patient stars;

Till at length the bell at midnight
  Sounded from its dark abode,
And, from out a neighboring farmyard,
  Loud the cock, Alectryon, crowed.

Then, with nostrils wide distended,
  Breaking from his iron chain,
And unfolding far his pinions,
  To those stars he soared again.

* * * * * *

Characters in the Homeric Stories

By Agnes Walker

THE gods and goddesses who interested themselves in the Trojan war were the most prominent in mythology and represented many phases of life. They were all related to each other.

Zeus' (Ju'piter) and Posei'don (Nep'tune) were brothers. They were the sons of Kro'nos (Sat'urn), the God of Time. Zeus (Jupiter) was the king of the gods and of men. Poseidon (Neptune) ruled the ocean. Phoe'bus (Apol'lo) was the god of archery, prophecy and music. He was one of the sons of Zeus (Jupiter). The other son A'res (Mars'), was the God of War. Both Zeus's (Jupiter's) daughters, Pal'las Athe'ne (Miner'va) and Aphrodi'te (Ve'nus) had romantic births. Pallas Athene sprang from her father's head and was fully clad in armor. She was the Goddess of Wisdom. The owl was her favorite bird. Aphrodite sprang from the sea foam. She was the Queen of Love and Beauty.

He'ra (Juno) was the Queen of Heaven and of the gods and goddesses. She was the mother of Ares (Mars).

CAUSES OF THE TROJAN WAR.

The marrriage of Pe'leus and The'tis was an important event. They were the parents of Achil'les. Thetis was a sea goddess and Peleus was a mortal.

All the gods and goddesses were invited to the wedding except E'ris or Discord. She, naturally, was very angry at being neglected and determined to make trouble. So she threw a golden apple among the revellers, with the inscription on it "For the fairest." Thereupon Hera (Juno), Aphrodite (Venus), and Pallas Athene (Minerva) each claimed it. They brought the matter before Zeus (Jupiter). But he, not wishing to offend anyone of the three, sent them to Mount Ida, where the beautiful shepherd Par'is was tend-

ing his flocks. The goddesses appeared before him, eager to hear his decision as to which was the fairest.

Hera (Juno) offered him wealth and power if he would decide in her favor.

Pallas Athene (Minerva) declared that she would make him victorious in war if he would award the prize to her.

Aphrodite (Venus) assured Paris that she would procure the most beautiful woman in the world, to be his wife, provided he bestowed the golden apple on her. He did so. In return for this Aphrodite sent Paris to visit Menela'us, King of Spar'ta, and his wife, Hel'en, who was the most beautiful woman in the world. It was she whom Aphrodite decided should be the wife of Paris. With the help of Aphrodite, Paris persuaded Helen to elope with him. That was the cause of the Trojan War.

Hera (Juno) and Pallas Athene (Minerva) in consequence of the slight put upon their charms were hostile to the Trojans. Aphrodite (Venus) for the opposite reason, favored them. She persuaded Ares (Mars) who was her admirer, to lend his aid to the Trojan cause. Phoebus (Apollo) was neutral and Poseidon (Neptune) inclined to the cause of the Greeks. Zeus (Jupiter) although he loved Pri'am King of Troy, did not take sides with either party.

King Priam had been a good and wise ruler and had made many friends for Troy. Hec'tor, his son, was a valiant warrior, also an affectionate son, husband and father, very unlike his treacherous brother Paris. Hector was commander-in-chief of the Trojan army. Aene'as, Dēiph'obus, Glau'cus and Sarpe'don were also famous leaders in the Trojan army.

GRECIAN HEROES.

Agamem'non was King of Myce'nae and brother of Menelaus. He was chosen commander-in-chief of the Grecian army. He was stately and dignified in manner.

Achilles was one of the bravest Greek warriors. Di'omede ranked next to Achilles in daring and valor.

Odys'seus (Ulysses) was noted for his acuteness of intellect.

Nes'tor was a wise and experienced counselor. His advice was followed implicity.

Both Agamemnon and Achilles had tragic ends. The former, while attending a banquet, given in honor of his return from Troy, was murdered by his wife, Clytemnes'tra, and Aegis'theus.

Achilles, on seeing Polyx'ena, the daughter of King Priam, was so captivated by her charms that he wished to marry her. For this object, he promised to try to persuade the Greeks to grant peace to Troy. But Paris shot a poisoned arrow at Achilles while they were in the temple of Phoebus (Apollo) arranging the marriage. Phoebus directed the course of the arrow which wounded Achilles in the heel—the only vulnerable part about him. When an infant, his mother Thetis, dipped him into the river Styx' which had the power to make him invulnerable. She overlooked the heel by which she held him, so, unfortunately, that was not made invulnerable.

The Palla'dium was a beautiful statue of Pallas Athene (Minerva), which stood in Troy. It was said to have dropped from Heaven and it was believed that Troy would never be taken while the statue remained standing in that city. Odysseus (Ulysses) and Diomede disguised themselves, went into the city and carried off the statue.

Helen recognized Odysseus but did not betray him to anybody. She became reconciled to her husband and they sailed for Spar'ta. But the gods were angry at Helen for making so much trouble and sent them stormy weather which drove the ship to Cy'prus, Phoeni'cia and E'gypt. Helen and Manelaus, her husband, were hospitably entertained in Egypt and received valuable gifts. The people of Egypt presented Helen with a golden spindle and a basket in which to hold her spools and wool. Finally Helen and her husband reached Sparta in safety and, as the fairy tales say, "lived happily ever after."

Peace Propaganda

THE most important step in the peace propaganda of the last year is set forth in the *Nation* for September 23, 1909, in an article by Mr. Edwin Ginn, who explains the purpose of the International School of Peace whose founding he is furthering. "My own belief is," he says, "that the idea which underlies the movement for the Hague Court can be developed so that the nations can be persuaded each to contribute a small percentage of their military forces at sea and on land to form an *International Guard* or *Police Force*. Five per cent. of the present armaments would probably be found sufficient. * * *

"The plan which I would establish is somewhat as follows," Mr. Ginn continues in an explanation from which the following extracts are taken:

"(1) There should be founded, I think in corporate form, an International School of Peace. Such a corporation would be a permanent legal machinery for receiving and disbursing contributions and bequests.

"(2) This International School of Peace, whether incorporated or not incorporated, should have a president, secretary, treasurer and board of managers or directors, making up an executive committee constituted of men who are known for their soundness of judgment as well as for their devotion to the public welfare. An advisory council, consisting of men prominent in the peace movement, might well be constituted.

"(3) There should be a Bureau of Education, which should attempt to modify the courses of study in our schools, colleges, and universities, by eliminating the use of such literature and history as tend to inculcate unduly the military spirit and to exaggerate the achievements of war.

"International exchange of teachers and students, in accordance with the ideas which underlie the Rhodes scholarships, and the recent exchange of professors between Germany and America should be further extended, even among the teachers of our public schools.

"Social intercourse among the educators of different nations should be extended in every possible way.

"The circulation of such books as have already been published under the name of 'The International Library' should be advanced in every possible way, and the publication and circulation of other books having an analogous tendency should be encouraged.

"The coöperation of the clergy should also be obtained.

"Either separately, or as a part of this Educational Bureau, there should be an organized attempt to influence the press of the world.

"Again, why should not the government appropriate money for the proper training of its civil servants, ten thousand in number? Our business organizations—chambers of commerce and other similar associations—should be addressed and interested in this question of the burdens of war and of the threat and fear of war.

"(4) A political bureau should be instituted, which should employ men of statesmanlike grasp and power in all the main capitals of the world, to watch over the course of legislation and to work for the reduction of armaments."

Mr. Ginn is planning to give to such a school an annual income of $50,000 and to endow it after his death, and he hopes that other men will be ready to increase the fund to an efficient amount. He urges the enlistment of people of talent and ardor who will be ready to consecrate their utmost efforts to furtherance of the interests and activities of the undertaking.

On the evening of December 15, 1909, Mr. Ginn opened a room at 29 Beacon street, Boston, which is to be the headquarters for the present of the new school. Mr. Ginn spoke upon his motives and experiences in founding the school. Letters from President Huntington of Boston University, Miss Hazard of Wellesley College, Miss Woolley of Mount Holyoke, and others were noticed.

Dr. Trueblood, secretary of the American Peace Society, hailed Mr. Ginn's wise and generous proposal as a new evidence that at last the hard-headed business men of the world are waking up to the folly and enormity of the war system of nations.

Mrs. Fannie Fern Andrews, secretary of the American School Peace League, expressed the gratitude of the League to Mr. Ginn for gracious support and constant coöperation and called attention to movements looking toward similar work in France, Sweden, Germany, and elsewhere.

The Cosmopolitan Club of Harvard University was represented by a young student from Brazil. It was stated that the Harvard Cosmopolitan Club, which President Eliot has pronounced the most interesting club in the university, has a membership of two hundred students, only one-third of them Americans. In the twenty or more Cosmopolitan Clubs in our various universities there are now enrolled two

thousand students, all devoted to promoting international good understanding and fraternity.

Edwin D. Mead spoke of his own cordial and active relation to many agencies of the peace cause and his sense of the importance of the closest and most economical coöperation always among them all. The new School of Peace, which he hoped would concentrate largely upon the educational sides of the peace work, could render the Peace societies an incalculable service by multiplying books and pamphlets of the best character, to meet their needs and the varied needs of the cause; and it could reinforce most directly such efforts as those of the School Peace League and the Cosmopolitan Clubs. Where existing agencies were adequate, it should coöperate with those; but it should not be slow to enter new fields where work in such was clearly demanded. It had already started a department for work among the women's organizations of the country, where there is a large and greatly neglected opportunity.

The International Peace Library, established to publish and spread abroad peace literature is being developed to coöperate with the International School of Peace.

President Taft at the dinner of the American Peace and Arbitration League in New York on March 22, gave an interesting exposition of the attitude of the head of the nation toward the questions of peace and arbitration. President Taft said in part:

> I do not want to seem inconsistent in speaking so emphatically here in favor of peace by arbitration and in using every effort that I can to bring to bear on Congress to have two more battleships this year. I am hopeful that we may continue with that until the Panama Canal is constructed, so that then our naval forces shall be doubled by reason of the connection between the two coasts, and then we can stop and think whether we wish to go further. Perhaps by that time there shall be adopted a means of reducing armament.
>
> The expense of armament is working toward peace. The expense of war, I am sorry to say, is having greater weight in securing peace than the expense of lives. A nation does not lightly enter upon war now, and for two reasons:
>
> First, because the expense is so great that it is likely to lead her to bankruptcy even if she wins; and, second, that if she does not win, the government or dynasty or whatever it may be that is in control of the government, is likely to go down under the humilia-

tion of that defeat at the hands of her own people. These two things are working in a healthful way toward peace.

Now, if we have a permanent court of arbitration, one to which we can easily refer all questions, the opportunity is likely to be seized upon—certainly to be seized upon by that country that is in the contest to follow, if war is to follow, not quite prepared; and so by its demanding or proposing a reference to the court it will put the other country in the attitude of desiring war, an attitude that I think no country would like under present conditions to occupy before the world.

As resort becomes more and more frequent to this permanent court questions which can be submitted to the view of the nations will grow broader and broader in their scope. I have noticed exceptions in our arbitration treaties, as to reference of questions of honor, of national honor, to courts of arbitration. Personally, I do not see any more reason why matters of national honor should not be referred to a court of arbitration any more than matters of property or matters of individual proprietorship.

I know that is going further than most men are willing to go, but among men we have to submit differences even if they involve honor, if we obey the law, to the court or let them go undecided. It is true that our courts can enforce the law, and as between nations there is no court with a sheriff or marshal that can enforce the law. But I do not see why questions of honor may not be submitted to a tribunal supposed to be composed of men of honor who understand questions of national honor as well as any other questions of difference arising between nations.

ABU SIMBEL

Of Egypt's countless altars, only one
Hath still adoring fires; one only block
Is warmed with worship of the dawning sun
That pierces to it through the riven rock.

—*Katharine Lee Bates.*

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MAY.

Then came fair May, the fairest maid on ground,
Deck'd all with dainties of her season's pride,
And throwing flowers out of her lap around:
Upon two brethren's shoulders she did ride;
The twins of Leda, which on either side
Supported her like to their sovereign queen.
Lord. how all creatures laught when her they spied,
And leapt and danced as they had ravish'd been,
And Cupid's self about her fluttered all in green.

—*Edmund Spenser.*

1910 REPORT BLANKS.

Each member of the Class of 1910 should receive during the month of May a circular entitled "Report Blank and Final Address to the Graduating Class." This circular contains spaces for report of the four years' reading and of any real work which has been done, together with the dates of Recognition Day at various Chautauqua Assemblies and the time limit for sending in reports.

Any member of 1910 who does not have this blank in hand by June 1 should notify the office at Chautauqua, New York.

The blanks described above should be returned promptly by people who wish to receive their diplomas at Chautauqua or at some other Assembly.

Members to whom diplomas are to be sent by mail need not finish their reading until October first. Readers

Hall of Philosophy, Mountain Lake Park Assembly, Maryland.

who are eager to graduate at an Assembly should not be discouraged if they are somewhat behind in their work now, for wise management of time accomplishes wonders. It should be remembered that no written examinations are required. Reporting the four years' reading to the Chautauqua office and payment of the proper fee is all that is necessary to secure a diploma. Seals may be added to the diploma by the answering of review questions, but this may be postponed a little if necessary.

1910's Recognition Day at Chautauqua will be August 17. The address will be given by Mr. Edward Howard Griggs. The Baccalaureate Sermon will be preached on Sunday, August 14, by Bishop John H. Vincent, Chancellor of Chautauqua Institution.

MOUNTAIN LAKE PARK.

That the Assembly at Mountain Lake Park, Maryland, is a true child of the parent Chautauqua, preserving the family names and traditions, is proved by the cuts shown in this number. The Hall of Philosophy shelters many a gathering of clever people, as in New York, and the C. L.

The Golden Gate at Mountain Lake Park Assembly, Maryland.

S. C. graduates pass through a symbolic Golden Gate as at the older shrine. Mountain Lake makes especial development of the children's activities.

THE 1910 BANNER.

The banner committee of the Class of 1910 has engaged Mr. Henry Turner Bailey, editor of *The School Arts Book*, and Head of the Arts and Crafts Department of the Chautauqua Summer Schools, to make the design for the 1910 Class banner. Not only the design is to be made by him but the work of making the banner is to be under his immediate direction. A color drawing of the design is now in the hands of the committee and will be approved within a short time. A description of the banner will be given later in the Round Table.

RAILROAD TRAVEL MADE EASY.

The Accommodations Number of *The Chautauquan Weekly* gives the would-be visitor to Chautauqua a large amount of information as to ways of reaching the C. L. S. C. Mecca. It is all as easy as present-day labor-saving methods of travel can make it. Nevertheless, difficulties often arise from ways of looking at things, and so imgained hardships may make the trip seem impossible to some people unaccustomed to travel, who, nevertheless, are eager to share in the symbolic ceremonies of Recognition Day. If those folk will tell their desires and their troubles to the Editor of the Round Table (addressing him at Chautauqua, New York,) they will find him ready with a variety of suggestions that may help to solve the difficulties. If it is guidance that is needed he knows accredited chaperons who are eager to guide, and if it is companionship he knows other travelers who may be willing to accept an addition to their party. The prospects look bright for a large gathering on Recognition Day. It rests with YOU to make it larger still.

CHARACTERS IN THE HOMERIC STORIES.

It will be a convenience to many readers to have for reference the concise descriptive list of the gods and heroes

mentioned in the Iliad and Odyssey, which appears in this magazine. Both Greek and Latin names are given and the accent is indicated in every instance, while the brevity of the "Who's Who" paragraphs makes it possible to memorize easily the information which they contain. The author of this article is herself a C. L. S. C. reader, and first put the material into this convenient form for her own use.

SEAL FOR MAGAZINE READERS.

In the back of this number of the magazine will be found a list of fifty questions based on the three required series of articles for the current Classical Year. Correct answers to these questions will entitle graduate readers to a seal. Answers should be numbered to correspond with the numbers on the list. Papers should be addressed to the office at Chautauqua, New York.

MAGAZINES AND THE CLASSICAL YEAR.

How a man's own name stands out from the hurly-burly of a newspaper page! And how many references are continually cropping up whenever interest is aroused in any especial subject! Magazines are constantly publishing articles that make interesting supplementary reading for C. L. S. C. workers. The *Literary Digest* for February 19, for instance, has a description by Henry Turner Bailey of his recent trip in Grecian waters. He calls his article "My Odyssey." A contribution to a recent *American,* says that "The Return of Ulysses," a drama by Jules Lemaitre, acted by members of the Comédie Française, has been produced in France in the moving picture "theaters"—a hint for people eager to elevate the tone of these places in America. *Current Literature* for November, 1909, gives the gist of several articles on Halley's comet under the general title, "Return of the Most Famous Comet in the Universe," while the March number does the same for the "Sunset Comet," which

it calls "The Unexpected Comet." Egypt furnishes a never-ending supply of material for periodical literature. The world is keenly interested today in any new information about the life of that faraway time, and "Recent Explorations in Egypt," by Dr. George A. Reisner in the *Independent* of February 10, and an illustrated article on a set of "Graeco-Egyptian Portraits" recently purchased by the Metropolitan Museum, described in the March Bulletin of the Museum, make excellent reading for the Egypt lover.

CLOSING PROGRAMS.

The Suggestive Program given farther on covers the remainder of the required work for the Classical Year. If a general closing program is desired either as a substitute or as the feature of an additional meeting, the year's work is full of suggestions. There might be a Greek Evening with the reading of the translation of some Greek play with distribution of parts, and the presentation of tableaux from Greek statuary; or a Roman Matron's Day told in readings and papers, illustrated by tableaux, and ending with a banquet as modest or as splendid as may be wished; or a pantomime of scenes from the Iliad or the Odyssey following the Flaxman drawings and explained by extracts read from the "Stories;" or a presentation of the Seven Ages of Woman, a series of characteristic recitations spoken by circle members in the dress of the periods suggested by the Cooke articles, such as a Hopi Indian bride, Aspasia, Cornelia, St. Elizabeth of Hungary, Fanny Burney, Queen Victoria, and ending with the most individual figure of the present day, a Suffragette of 1910. A Medieval Fair opens possibilities for beautiful costumes and varied entertainment, and a Gathering of Stars gives an opportunity for the actors of star parts to form constellation outlines of themselves, or reënact old myths.

Any accounts of especially successful closing programs will be welcomed by the Round Table.

C. L. S. C. MEMORIAL DAYS.

OPENING DAY—October 1.
BRYANT DAY—November 3.
SPECIAL SUNDAY—November, second Sunday.
MILTON DAY—December 9.
COLLEGE DAY—January, last Thursday.
LANIER DAY—February 3.
SPECIAL SUNDAY—February, second Sunday.
LONGFELLOW DAY—February 27.
SHAKESPEARE DAY—April 23.
ADDISON DAY—May 1.
SPECIAL SUNDAY—May, second Sunday.
INTERNATIONAL PEACE DAY—May 18.
SPECIAL SUNDAY—July, second Sunday.
INAUGURATION DAY—August, first Saturday after first Tuesday.
ST. PAUL'S DAY—August, second Saturday after first Tuesday.
RECOGNITION DAY—August, third Wednesday.

PROGRAM FOR ADDISON DAY (MAY 1).

Historical Sketch—"Why was Queen Anne's reign famous?"
Composite "Life of Addison" given orally.
Reading from "Sir Roger de Coverley."
Singing—"The Spacious Firmament on high."
Recitation—"An Essay on Fans" with appropriate action.
Extract from Macaulay's "Essay on Addison."
Tableaux—A Coffee-House Scene with Addison, Swift, Steele.

PROGRAM FOR INTERNATIONAL PEACE DAY (MAY 18)

Singing—"These things shall be."
Roll Call—Peace Quotations.
Reading—From "The American Public School as a Factor in International Conciliation" by Myra Kelly.
Summary—Of the Year's Peace Work.
Recitation—"Angel of Peace, thou hast wandered too long!" by Oliver Wendell Holmes.
Address.
Flags of all Nations Drill by children.
Singing—"Hear, O Ye Nations!"

Program material may be obtained from the American Peace Society, 31 Beacon street, Boston, Mass., and the American Association for International Conciliation, 501 West 116th street, New York City.

OUTLINE OF REQUIRED READING FOR JUNE.

MAY 29-JUNE 4.

In THE CHAUTAUQUAN: "Woman in the Progress of Civilization," Chapter IX. "Woman's Influence on Civilization." "A Reading Journey through Egypt," Chapter IX. "Abu Simbel and Nubia." "Historic Types of Architecture," Chap. IX. Roman.

SUGGESTIVE PROGRAM FOR LOCAL CIRCLES.

1. Review and discussion of "Women's Influence on Civilization."
2. Paper. "Individualism and Collectivism."
3. Review and discussion. Roman Architecture.

4. Roll Call—Famous buildings in Rome.
5. Review and discussion. "Abu Simbel."
6. Composite story of "The English in Egypt." (See references in Travel Club.)
7. Quiz on the "Celestial Menagerie" in this number.
8. Review of article on Halley's comet in this number.

TRAVEL CLUB.

1. Map Talk. "The Fortresses." (See Erman; Maspéro's "Dawn," ch. VI; and "Manual;" Rawlinson; Baedeker.)
2. "The English in Egypt," composite lesson recited by individual answers to questions previously given out. (See Cromer's "Modern Egypt;" Milner's "The English in Egypt;" Steevens's "With Kitchener to Khartoum;" Wallace's "Egypt and the Egyptian Inquisition;" White's "Expansion of Egypt;" "British rights in Egypt" in *Macmillan's Magazine*, vol. 70, 1894; "England and Egypt" in *National Review*, vol. 27, 1896; *Review of Reviews*, vol. 7, 1893; *Quarterly Review*, vol. 180, 1895; Present Situation in Egypt" in *Fortnightly*, vol. 57, 1895, and *Macmillan*, vol. 53, 1885-6; Gordon's "Journals at Kartoum;" Adams's "England at War;" for conquest of the Sudan see *Fortnightly*, vol. 66, 1896.)
3. Story—"A Trading Trip from the Sudan to Thebes." The story should state the make-up of the party, the means of transportation, the merchandise carried, the country passed through, and the adventures experienced. (See Erman; Breasted; Baedeker; "The Nubian Highway;" "A. P. Weigall, *Blackwood's* vol. 182, Dec., 1907.)
4. Paper. "Slavery in Egypt." (See Erman; Baedeker; Wilkinson's "Manners and Customs of Ancient Egypt.")
5. Descriptive readings on "Abu Simbel." (See Erman; Maspéro's "Struggle," ch. IV, and "Manual;" Warner; Rawlinson; Baedeker.)
6. Paper. "The World's Indebtedness to Egypt." (For knowledge of geometry, surveying, the sun-dial, etc., etc. See Rawlinson's "Herodotus;" "Masterpieces of Greek Literature," p. 311; Rawlinson's "History.")

ANSWERS TO SEARCH QUESTIONS ON MAY READINGS.

1. Baedeker describes the Nilometer at Cairo as consisting of a square well sixteen feet in diameter, having in the center an octagonal column on which are inscribed the ancient Arabian measures. The Arabian ell was about twenty-one and a quarter inches long. The zero point of the Nilometer is twenty-eight feet above the average level point of the Mediterranean so that the top of the column is nearly fifty-nine feet above sea level. The water of the Nile when at its lowest covers seven ells of the Nilometer. Fifteen ells and a fraction mark the height of water necessary for irrigating every part of the Nile Valley. When this height, the Wefa, is proclaimed, the embankments of the irrigation canals are cut amid the merry-making of the people.

1. Victor Marie Hugo (1820-85) was a poet, novelist, and playwright and the head of the French romantic school of the last cen-

tury. His literary career began precociously at the age of fourteen and from that time on his pen poured forth an unceasing stream. His best known plays are "Hernani," "Ruy Blas," and "Marion Delorme;" his most famous novels, "Notre Dame de Paris" and "Les Misérables." 2. Margaret Fuller, the Marchioness Ossoli, born at Cambridgeport, Massachusetts, and lost at sea (1810-1850), wrote in 1845, "Woman in the Nineteenth Century." At the time of its publication it was considered extremely radical. Margaret Fuller was one of the "Transcendentalists." She edited the Boston *Dial* and was literary critic for the New York *Tribune*.

1. Thomas Bruce, Lord Elgin, was British envoy to Constantinople from 1799 to 1802. Between 1801 and 1803 he sent to England the sculptures from the Parthenon together with a column and caryatid from the Erechtheion which were bought by the nation in 1816 and placed in the British Museum. 2. "What the Goths did not do the Scots have accomplished," or, freely, "The Scots have finished what the Goths began." The references are to the customary vandalism of the Goths and to Lord Elgin's Scotch birth. 3. Théophile Gauthier, the French poet, critic and novelist was born in 1811 and died in 1872. "Loin de Paris" ("Far from Paris") was published in 1864 and was one of a number of volumes which covered the author's travel experiences. 4. Marcus Vitruvius Pollio was an architect and military engineer under Caesar and Augustus. His treatise on architecture was considered authoritative during the Renaissance. 5. The Erechtheion was a temple which contained the tomb of Erechtheus, a son of Hephæstos (Vulcan). 6. Pirates touching for water at the island of Dia, captured the lad Dionysus (Bacchus). Instead of taking him to Naxos, as he begged, and as their captain ordered, they headed for Egypt to sell him into slavery. He caused the ship to stand fast in the midst of the sea. Ivy hindered the play of the oars, vines heavy with clustering grapes twined the mast, tigers and panthers sported about the feet of the god and music filled the air. The terror-stricken pirates leaped into the sea and became dolphins. The master of the ship alone was left his human shape as reward for his kindness to Dionysus in distress.

REVIEW QUESTIONS ON REQUIRED READINGS FOR JUNE.

"WOMAN IN THE PROGRESS OF CIVILIZATION." CHAPTER IX. "WOMAN'S INFLUENCE ON CIVILIZATION."

1. What has been the place of sex in evolution? 2. To what extent does the child inherit from the mother? 3. What is the extent of the mother's influence upon the child's early training? 4. What economic problems have been raised by the disinclination of modern women to marry? 5. In what respects is woman especially fitted for the creation of the home? 6. How are the relative activities of man and of woman regarded in China? In India? By modern science? 7. Show how sex differentiated the control of the arts of production and consumption. 8. At what stage in the progress of civilization did the influence of women begin to fall behind that of men? 9. Explain the effect of the development of agriculture, of hunting, war, slavery, and competition upon the economic situation of women. 10. Explain the modern physical inferiority of women. 11. Illustrate by historical examples the effect of selection in marriage. 12. What was the cause and what has been the

effect of a double standard of morality? 13. In what respects have women of the lower classes been more fortunate than those of the upper classes? 14. Give examples from ancient history illustrating women's possibilities. 15. What developments of the Renaissance especially affected women? 16. Show how individual freedom and state expansion correlate. 17. What are some of the temporary evils resultant from the present reconstruction of the social and political interests of women? 18. What was the effect of the patriarchal system upon the progress of civilization? 19. Name some modern women whose work has been important. 20. State in detail the five results toward which civilization is aiming.

"A READING JOURNEY THROUGH EGYPT." CHAPTER IX. "NUBIA AND ABU SIMBEL."

1. Locate Nubia. 2. What is the history of its relation to Egypt? 3. Of what importance was Meroe? 4. What insight into the ancient Nubian language has been made recently? 5. What was the history of Christianity in this nation? 6. What remains are visible during the passage of the lake? 7. What is interesting about the Amada temple? 8. What happened at Toshkeh? 9. How does the temple of Abu Simbel illustrate Egyptian architectural purpose? 10. How does the sun-god visit the temple of Abu Simbel? 11. What do the reliefs of this temple represent? 12. What are the surroundings of the temple? 13. What limit is marked by Wadi Halfa? 14. What difficulties beset the traveler in the Cataract region? 15. What are the most southern buildings of the Pharaohs on the Nile? 16. What was General Kitchener's contribution to travel in this region? 17. What are the southernmost remains on the Nile? 18. Trace the course of Egyptian influence upon Mediterranean civilization.

HISTORIC TYPES OF ARCHITECTURE. IX. ROMAN.

1. What peoples near Rome contributed to her knowledge of decoration? 2. Why is Roman architecture important in the history of art? 3. What did Rome contribute to the structural side of architectural knowledge? 4. What is meant by barrel vaults? 5. What is the value of the Roman development of the idea? 6. What was the Roman method of lighting large halls? 7. What is the canon of Roman architecture composition? 8. Describe the Pantheon. 9. What were the building materials used by the Romans? 10. How was the "core" of a building prepared? 11. What decorations were employed? 12. Explain the Roman arcade. 13. When the orders of architecture were placed one above another in what order were they superimposed? 14. What five columnar orders were used by the Romans? 15. Why was the Corinthian order best liked at Rome? 16. What sort of buildings did the Romans build chiefly? 17. Why is the Maison Carrée (Square House) at Nimes an interesting building? 18. Where were the best circular temples found? 19. Discuss the Roman fora. 20. Discuss the Roman basilicas. 21. Describe the Roman baths. 22. What were the proportions of the Colosseum? 23. How has Roman architecture influenced modern architecture?

SEARCH QUESTIONS ON JUNE READINGS.

1. What is understood by the mahdi? 2. Who was Burckhardt? 3. Who was Belzoni?

1. Where was Nimes?

1. What were the duties and the privileges of the Vestal Virgins? 2. What was Sappho's nickname? 3. What was Aspasia's birthplace? 4. Who and what was Hypatia's father? 5. What was Georges Sand's real name? 6. Who was Sonya Kovalevsky? 7. What was Madame Curie's contribution to science? 8. What are Madame de Staël's best known writings? 9. What work of Frederika Bremer's is especially interesting to Americans?

GRADUATE MAGAZINE SEAL MEMORANDA

Review Questions on the Three Required Series in The Chautauquan for 1909-10.

Correct answering of these questions will entitle graduate readers to a seal on their diploma.

"Reading Journey through Egypt"

1. Describe briefly the physiography of Egypt. 2. What was the first great epoch of Egyptian history and why was it great? 3. What position does the Middle Kingdom hold in Egyptian history? 4 Who were the most powerful rulers of the Empire? 5. What was the cause of the Decadence and what chieftain brought about the Restoration? 6. What nations have ruled Egypt since 525 B. C.? 7. What buildings, no longer standing, once made Alexandria famous? 8. Name ten street sights of Cairo. 9. Describe the situation and the size of the Great Pyramid. 10. What is the Sphinx? 11. Connect Osiris with Abydos. 12. Describe the temple of Seti I at Abydos. 13. What story is told in carving on the front of the temple of Luxor? 14. Why is the temple of Karnak important to the student of the Egyptian Empire? 15. What are the colossi of Memnon? 16. Of what value to the student are such tomb decorations as those of Beni-hasan, Abd el-Gurna, and the tomb of Paheri? 17. What are some of the parts of the Egyptian temple as found in the temple of Edfu? 18. What evidence of historic activity are to be seen at Gebel Silsileh? 10. What is the cause of the changes at Philae? 20. How does the sun-god visit the temple of Abu Simbel?

"Historic Types of Architecture"

1. What are the five notable features of Egyptian Art? 2. Sketch briefly the development of the temple form. 3. Why was the arch the basic element of the Chaldaean and Assyrian architecture? 4. Describe briefly the Tomb of Cyrus. 5. What did the lion and the eagle symbolize in Hittite art? 6. What elements of the Egyptian temple were reproduced in the Mosaic tabernacle? 7. Of what does an Order of Architecture consist? 8. Mention three peculiarities of the structure of the columns of the Parthenon, and state the general reasons for the peculiarities. 9. Describe the Ionic column. 10. How has Roman architecture influenced modern architecture?

"Woman in the Progress of Civilization"

1. What was the earliest form of the family? 2. What were the institutions of endogamy and exogamy? 3. What was the institution of totemism? 4. How was ancestor worship connected with the laws of paternal descent? 5. In early empires what was

understood by the term "famliy?" 6. Sketch briefly the position of the Roman woman at the beginning of the Empire. 7. What was the attitude of early Christianity toward women? 8. How were land, military system, Christianity, and symbolism connected with feudalism? 9. What was the attitude of chivalry toward women? 10. What was the communal system? 11. What was the education of different classes of women in the Middle Ages? 12. What was the attitude of the gilds toward women? 13. How were women regarded during the Renaissance? 14. Name some of the famous women of the Renaissance. 15. On what grounds was it first urged that women should have equal rights with men? 16. What did Mary Wollstonecraft demand for women? 17. What was the condition of women after the French Revolution? 18. What is the general basis of the new arguments for giving the suffrage to women? 19. How did the working conditions of women start the collectivist movement? 20. What are the five results toward which civilization is aiming?

Number your answers to correspond with the numbers of the questions above. (See Round Table, page 442.)

Talk About Books

CULTURE BY CONVERSATION. Robert Waters. New York: Dodd, Mead & Co. Pp. 343. $1.20 net.

This book must have been a service of love, for the author dedicates it to a friend, "to whose conversation," he says, "I owe more true education than to all the books I ever read." With the memory of such a friend in mind he writes a helpful, entertaining, illustrative, and culture-making book. In the introduction there is a sharp distinction made between culture and mere scholarship; a scholar may be "awkward or uncouth in manner," the man of culture is at home in any society. So with the idea of the need for broad culture the author sends forth his book, which has three general divisions: Educational and Literary Influences of Conversation; Social and Intellectual Influences; Some Table-Talks. As one reads he is charmed with the wealth of illustrations, each one enforcing pointedly the lesson desired. The book is a splendid example in writing of the very principles that it insists upon for conversation.

ESSAYS OUT OF HOURS. By Charles Sears Baldwin, Pp. 161, 9. New York: Longmans, Green & Co. $1 net.

The essays of this volume, though largely of a literary nature, include also several of a more general type, personal essays such as "False Gypsie," "Salad," and "Travel," reprinted from the *Atlantic Monthly*. These last are less successful both in matter and form than the literary studies, being rather thin in substance and artificial in style. The studies entitled "The Secret of John Bunyan" and

"Three Studies in the Short Story" are more direct in form and contain critical material of some value.

LESSON STORIES FOR THE KINDERGARTEN GRADES OF THE BIBLE SCHOOL. Lois Sedgwick Palmer. Outline by Professor George William Pease. New York: The Macmillan Co. Pp. 127. Price 75c net.

This book contains lesson outlines, with suggestions for providing material for teaching and giving hints on the using of the same. There is a general subject: "God, the creator, providing all things for his creatures." This general subject is divided into seven topics, with from two to seven lessons under each topic. There are also topics for special days, Thanksgiving, Christmas, and Easter. The book with its bibliography will be helpful to kindergarteners.

MAGAZINE WRITING AND THE NEW LITERATURE. By Henry Mills Alden. Harper & Brothers: New York. 1908. Pp. 321. $2.00 net.

Henry Mills Alden, for forty years editor of *Harper's Magazine*, collects in this volume many of his literary essays contributed from time to time to the Editor's Study of that publication. His aim is twofold; to show the influence of periodicals upon modern literature and to explain modern literature in the light of the new movements of thought which characterize the last fifty years. Mr. Alden is a literary optimist who finds much of our recent prose fiction excellent and who looks forward eagerly to the advent of the genius to be who will express the modern spirit in a manner not yet attained. His experienced judgments and wide appreciations will find favor with all students of modern literary tendencies.

A FIELD BOOK OF THE STARS. By William Tyler Olcott, author of "In Starland with a Three-Inch Telescope." New York: G. P. Putnam's Sons. 163 pages. Price $1.00.

The "Field Book of the Stars" by William Tyler Olcott presents a series of fifty diagrams of constellations, grouped under the seasons in which they may be observed to the best advantage, and located with relation to stars and constellations previously found and studied. The volume also contains several short chapters on such subjects as the Planets, the Milky Way, the Motions of the Stars, Meteors, and is completed by a list of the names of the stars and their meanings, and by several convenient tables. The book is of comfortable size and weight as a field companion. It is intended for the observer with the naked eye or the opera-glass, and admirably supplements the author's volume, "In Starland with a Three-Inch Telescope," which was noticed in the February CHAUTAUQUAN. The price of each book is $1.00.

Chautauqua, N. Y.

June 30--August 28, 1910

Advance List of Leading Lecturers

(Engagements up to Feb. 1, 1910.)

Bishop John H. Vincent	August 14
Dr. J. Wilbur Chapman	August 1-6
Dr. Chas F. Aked	July 23-29
Bishop C. D. Williams	July 18-22
Professor Albert Bushnell Hart	July 4-10
Sir William and Lady Ramsey	July 23-29
Mr. Edward Howard Griggs	August 8-13
Mr. John Graham Brooks	July 18-22
Mr. Horace Fletcher	July 11
Mr. W. J. McGee	August 6
Mrs. Philip Snowden	July 25-29
Rev. Samuel McChord Crothers	July 18-22
Mr. Henry Turner Bailey	July 14, August 10
New York Symphony Orchestra	July 30
Sylvan Players	August 5, 6
Francis Wilson and Chautauqua Pageant	August 17
Rev. Hugh Black	August 1-5
Rev. Alfred E. Lavell	August 1-5
Prof. C. Alphonso Smith	August 4, 5
Rev. G. A. Johnson Ross	August 7-12
Mr. Leon H. Vincent	August 15-20
Prof. Edward A. Steiner	August 22-25
Mr. Charles Stelzle	August 23
Mr. John B. Lemon	August 23
Rev. S. A. Steel	July 6
Mr. Edward Amherst Ott	July 15, 16
Mr. Ernest Thompson-Seton	August 15
Mr. Herbert K. Job	July 16, 30
Mr. Franklin Matthews	July 26
Mr. Herbert L. Bridgman	July 28

READING HOURS AND EVENING RECITALS

These events include a number of five o'clock reading hour series as well as the more formal evening dramatic recitals. The list of readers includes Mrs. Emily M. Bishop, of New York City; Miss Mabel Bragg, New York City; Professor S. H. Clark, the University of Chicago; Rev. Samuel McChord Crothers, Cambridge, Mass.; Mr. Edward Elliott, Boston, Mass.; Mr. Adrian Newens, Chicago; Miss Katherine Oliver, Kenton, Ohio; Mr. Charles F. Underhill, Brooklyn.

37th Assembly